Authorite de la company de la

MICROCOPY RESOLUTION TEST CHART (ANSI and ISO TEST CHART No. 2)







**14:1** 



#### A SELECTIVE MICROFILM EDITION

PART IV (1899–1910)

Thomas E. Jeffrey Lisa Gitelman Gregory Jankunis David W. Hutchings Leslie Fields Theresa M. Collins Gregory Field Aldo E. Salerno Karen A. Detig Lorie Stock

Editors

Robert Rosenberg Director and Editor

Director take Ekde

Sponsors Rutgers, The State University Of New Jersey National Park Service, Edison National Historic Site New Jersey Historical Commission Smithsonian Institution

> University Publications of America Bethesda, MD 1999

Edison signature used with permission of McGraw-Edison Company

#### Thomas A. Edison Papers

Rutgers, The State University endorsed by

National Historical Publications and Records Commission 18 June 1981

Copyright © 1999 by Rutgers, The State University

All rights reserved. No part of this publication including any portion of the guide and index or of the microfilm may be reproduced, stored in a retrieval system, or transmitted in any form by any means—graphic, electronic, mechanical, or chemical, including photocopying, recording or taping, or information storage and retrieval systems—without written permission of Rutgers, The State University, New Prunswick, New Jersey.

The original documents in this edition are from the archives at the Edison National Historic Site at West Orange, New Jersey.

ISBN 0-89093-703-6

#### THOMAS A. EDISON PAPERS

Robert A. Rosenberg Director and Editor

Thomas E. Jeffrey Associate Director and Coeditor

Paul B. Israel Managing Editor, Book Edition

Helen Endick Assistant Director for Administration

Associate Editors Theresa M. Collins Lisa Gitelman Kelth A. Nier

Research Associates Gregory Jankunis Lorie Stock Louis Carlat Aldo E. Salerno Secretary Grace Kurkowski

Assistant Editors

#### Student Assistants

Amy Cohen Jessica Rosenberg
Bethany Jankunis Stacey Saelg
Laura Konrad Wojtek Szymkowiak
Vishal Nayak Matthew Wosniak

#### BOARD OF SPONSORS

Rutgers, The State University of New Jersey

Francis L. Lawrence Joseph J. Seneca Richard F. Foley David M. Oshinsky

New Jersey Historical Commission Howard L. Green National Park Service John Maounis

Maryanne Gerbauckas Roger Durham

George Tselos Smithsonian Institution

Bernard Finn Arthur P. Molella

#### EDITORIAL ADVISORY BOARD

James Brittain, Georgia Institute of Technology R. Frank Colson, University of Southampton Louis Galambos, Johns Hopkins University Susan Hockey, University of Alberta

Susan Hockey, University of Alberta Thomas Parke Hughes, University of Pennsylvania Peter Robinson, Oxford University

Philip Scranton, Georgia Institute of Technology/Hagley Museum and Library Merritt Roe Smith, Massachusetts Institute of Technology

#### FINANCIAL CONTRIBUTORS

PRIVATE FOUNDATIONS
The Alfred P. Sloan Foundation
Charles Edison Fund
The Hyde and Watson Foundation
National Trust for the Humanities
Geraldine R. Dodge Foundation

PUBLIC FOUNDATIONS
National Science Foundation
National Endowment for the
Humanities
National Historical Publications and
Records Commission

International Brotherhood of Electrical

Matsushita Electric Industrial Co., Ltd.

Mr. and Mrs. Stanley H. Katz

Midwest Resources, Inc.

Minnesota Power

#### PRIVATE CORPORATIONS AND INDIVIDUALS

IMO Industries

Workorg

Alabama Power Company
Anonymous
AT&T
Atlantic Electric
Association of Edison Illuminating

Association of Edison Infilminating
Companies
Battelle Memorial Institute
The Boston Edison Foundation
Cabot Corporation Foundation, Inc.

Cabot Corporation Foundation, Inc.
Carolina Power & Light Company
Consolidated Edison Company of New
York, Inc.
Consumers Power Company
Cooper Industries
Corning Incorporated

Corning Incorporated
Duke Power Company
Entergy Corporation (Middle South
Electric System)
Exxon Corporation
Exxon Corporation
Florida Power & Light Company
General Electric Foundation
Gould Inc. Foundation
Guilf States Utilities Company

David and Nina Heitz Hess Foundation, Inc. Idaho Power Company New Jorsey Boll
New York State Electric & Gas
Corporation
North American Philips Corporation
North American Philips Corporation
Philips Lighting B.V.
Philips Lighting B.V.
Philips Electric and Gas Company
RGA Corporation
ROA Corporation
Robert Boseth GmbH
Rochester Gas and Electric
Savannah Electric and Flower Company
Schering-Plough Foundation

Texas Utilities Company
Thomas & Betts Corporation
Thomson Grand Public
Transamerica Delaval Inc.
Westinghouse Foundation
Wisconsin Public Service Corporation

# START

## 

#### A Note on the Sources

The pages which have been filmed are the best copies available. Every technical effort possible has been made to ensure legibility.

### PUBLICATION AND MICROFILM COPYING RESTRICTIONS

Reel duplication of the whole or of any part of this film is prohibited. In lieu of transcripts, however, enlarged photocopies of selected items contained on these reels may be made in order to facilitate research.

#### William H. Meadowcroft Papers Reminiscences by Edison G. Mr. Edison's Notes

This document is a photocopy of an Edison notebook from October 1908. It contains a narrative of incidents from his boyhood, young adulthood, and years in Menlo Park. The notes are all in Edison's hand. A label on the front cover bears the following typewritten notation: "Book No. 2, Mr. Edison's notes e. Biography. October, 1908." The pages are unnumbered. Approximately 60 pages have been used. The original manuscript is at the Edison Whiter Home in Fort Myers, Florida. The archives of the Edison National Historic Site holds a typescript prepared by Meadowcroft from Edison's notes.



several wheels on the af Ench wheal worre the me or one colace hadractions of wor the Jame as an ordenery Cou one wheel made to Repolute of at the lott of advanced the adjusant coleal 1 or the

Excited people I sat up on the top after wuter booth to watch the surging Crazy Crowd one man Came to both, practed a pencil allemaled to write a meason to Boston the 1st alrake went chear aff the blank he was so exected that he had the oper write the nuces of for him and det great Grazy or attook for men to thousand the war con the head the war on Shake Edwar we are of we havn't got a Cent, I felt very happy because were work poor There see ausuns but they been rarely Of friend of mine was an ofer who worked wi the back office be Com Beldeng Co 60 Port Down which were head quarters for Fish. Gould was up town with Eric

with wines, gould seemed to be in charge Fish Obsing the Executive, Fish work a Velvet corderoy cout + a very peaulean vest, he was very chipper + seemed to be light hearted of happy, setter dozen fine looking men all had the Complexion of Cadavery the two a backet of the property that hundred of boyo was rushing the checks for the checks for population to the checks for the c When you Brown & Brown Bros & Co gots all gament were seems at her fourth found of Manhing Cont has at the seems checks at Beldon & Co for some time with the Street got wind of the game, Those was some kind of al comprany with government of

and messages that opened in Eget to real fraction of word of God file to 132 a though our back to that guathan all night long he street were will of people Every bracker of fice was brittently fitted all hands ever the or The Cleaning to make there of the Champed of wood and mixed in they were tremberaged or must be work they were While a mining with I and Timb The come of the train many fractual organization which I attend We donne propose the whole I would be a very large train to the world the very large trained to the come of that trained would be altered to a delay of the atop over thee I constit get a chance to me the free of Egypt, I fees wish I was

\* ...

Very consion to do this I had been allowed to fire a could handle the Quall ticks of wood Expettly Keep dream up a also now and then ? would be allowed to switch a freeg Can around to the freight aled to unload small 6 aloka of freight but I wanted to get a Ela form Long rund = E sure mough both the Engineer of fire wors tire but rown sleepy from the good chear They had Taken, I got the Enguesi to consent to allowing the oferemento run the & The Ligary was ond of a fundament Leave to the GTR 60 the Chicago Burley Kon a Guerraly K It had bright brass Glands and all over the umodors Vanderbilt stoppe touches read after running about 15 miles The furnant conedit Keep his Eyes open + he agreed to permet me to

I look change uduring the speed to about 12 wifes an hour + brought the train of 7 caro to her cledination the fraud truck punction safely but there was something occurred which I was very much warried a Gout a conter + 7 Knew that of it got low the boiler was likely to Explode 9 gettered The from bearing Convervation among the Engluson is I kept constantly kest full of water that you than to wife Gefore Glack damp and und blew out extele stack T Covers every point with Engine including myself. I was about to owner to fine to out to the Concatcher one Oil Cup on the steam chest found oil in I started to come out the proceeding when upon Opening the oil Cup the the stead rushed out with a

back in the Cab ormade up I that she would tule (ho cuttent oil I be allewe went but to oil the point of failer to notice my powers of observation was very much improved after the the Junction and or oight, so much so that wh I pulled but the yound ever work turned out to see It stanged of carried columned Carried over into the stack +

One allumon about a week Go Christian dur train jumped the track near Ution 4 old Michigan Coulople Can with rotten with collapsed in the detal + all went to be distributing fige ruising dates + Candies all over the wack & ditch I started into to save all I done of this by setting it our family doctor had the Connection. Fust before the war brake out there came to the train one afternoon in Detroit 2 fine Locking young New Caccompact of Calor Renorm They bought titled for Port Human the leadership out to papers, The brain was called the

cooken I come of porte the Z from It want population all what from the line them the out Colored man said Nicolimus pay this Coy, I told him the dundount + be opened as a table dilect Know what to wak of chin transchin- 7 returned with some the Mustraled papers & Mond out of the word own Nicodemay - I the sections all the maguzum + novels 9 had not been able to sell thunking perhaps This would be too much for Mi Cory 1 mm to Case they be again to the Cory 1 mm to Case they be a could grow the Cory 1 mm to C

ovels he promple with Crucked hickory kuts, Ihan pop Com balls of funakly - Mala Candy - all went out o I felt like Aloren Day the great wow chance and mile I get a to my strent which was about 072 Johnpr of a Congenters Ch beggage Can to the pooling ull this from the It was almost too which for me already but for my coften but funder 9 got it is of this man if pulled off my coften that down the chest They he asked what have you Goy Load Everythin Cull apare that to fort sale, The ast sale + in the rear of the Car There men were from the Douth - I have already retained a soft opation my belout for a southern gentle

well was somewhat inventing of corse talked on all kinds of Electrical nnell was at when I was in the depart of was greported the Iter BO told him it

that orders had see tidoolo Bun + White he wouldn't discharge Burnell 1 200 hum off undefinitely - Van Duzer was so liment that if under wide want durchy all he had to do wasto want 3 days then go or out on the drop The world to laken back but Vom O sware he never would give had laken the \$800 + cent the mean at the regular rate which was 25 Cents it would have

took the \$500 + then sent the message Drad head he conedut stand it - he would never relent. One night Iwas wacken of Christony which stores of always wished of had never entered in the places were all kinds of 600 100 many of them durated in wax of flesh by cul The pe I have wind freed with

Extending to the Coundary line of our reservation hearly Every nig we would hear a leneel on Corporal of the ground to 1 this would be reported + senting to Gently with it Certa Corporal sof the quanto was worted Wignelf the Little Deulch 60n
the town of the selling from
the town of the selling o

to the 3rd as out This 6 brot the Corper along the 1/2 m (the track to the wind stock) her wind stock her wind stock we think and my the solution of th went they were watching + co Welter benear Goy took hum to the look up Jat the of the house I fushed for the Celler in one small apartment There were 2 Colo of petitors - a 30 to one nearly Europe, 9 pound these roman with the other Gold sat clown - pulle the bol over my head Gallon up faller The Baldion had am aken my faller + they were searching the ceder me with caroles Hantern The Corporal was absolutely Coul I came cut, the celler of condent see how I care have gotten out of evanted to know from m hiding those on as we was from the that there was the was it was most

agh my mother kept a switch due all Acth Thomas Clock that has been worn off, my ideas when a different at time of any ideas when a different at time of experience within 9 get Experience within 9 get Experience within 5 get was rulease. The track Goy was rulease. The real day,

When I wan agained boy at Milan activated years and I + The sorn of the proposal or of the largest alors in the form whose against alors in the form whose against a factly of the I town to sown in a small ereck after playing in the water of which the troy with a war paramid in the troy with years a while the troy with we are put on it was after playing that I want against the water and the water and the sound out the water and the sound of a hard the way to the war out the transmitted was lateral town the water out with the way to the transmitted the sound that was lateral with him.

I take the water of the war of her wanted to have the transmitted the way that was lateral water him.

I take the way the want to the cross of pulled out has being

wooden the was was that shed on ten pen fine My father had a neighbor hamed for a highly Educated Soo Sympton a highly Educated talk politics ready Everynight with I return from town which varies from 11 To Pam, I would Save I would to practice I would give the paper to Clause a Mun My filter would have to get take news and the whi or wat get it ut all. This generally becauted in groung to Ged at 3 a

ou the train, a freehit Car his seal fitting as a begging a as a country and the train the country and a country and a country at the country and a country and a country at the country and a country and a country are a country as a country and a country There was no reulitation of Everbod. went with the baggage 200 to out hence I had it all to surprise -Heo Pullman had a small afrozilim Del working on his also pung Car or he milde me a Lat of wooden ne minde me a lat of loss dan apparents for my Chemean - Patter had anne my train work 9 would make chamean Experients of stick of floorighters and the loss of the following the booking whether would be to the photosopher would be to the photosopher would be the photosopher would be to the photosopher would be the photosopher would be the photosopher would be part of the photosopher when the protection we have the protection of the photosopher when the protection we have the protection of the photosopher when the protection we have the protection of the photosopher when the protection we have the protection of the photosopher when the protection of the photosopher when the protection of the protection of

he rubbed it it exposed a final surface a that got on five t water wouldn't put tout, be got a bad buin or 60xed my Ears so severely that & got somewhat deaf threafter This derefree has Gezw of great When we telegh affice & could only bear the holimand denilly on the table at which I sat + unlike the atter Ofro 9 was not bothund by the atter welment again in Experimenting on the transmitter so I could hear it, this unde the Celephone Commercial as the letechone receiver of Beck was too weak to be used as a transmitter Choose to was the same with the though The great defect and that material was the food rendering of the overtones in music + the husing Consonant

in speech I worked over one year To hours a day surfaces - all to opt the word Apecia perfectly suconded - supersound on the donk which was a fact, it gain, my nerves have Gen preserved to me as a country beliage is a person with normal he aning after I became a lely ( of 2 practice) for a long time to bready a man of a long to the state of aft in pehoods at it appears to by Elsely acquired then one can read 2 by 3 books in a Day where of Euch wond at a luke .

1. Abued for the purchal goved at that little contratted the allanere of Percepte College Co of was competing with the Tura Co a endeavouring to depress the Will Strek on the Exchange I wanted to wend the Welderk it with a view of selle unenter exceese a portion money at that time I'm

more than theth. This electronian apparent to thank of any more than women as it was an executive to the word of the first of the formal to the word in the word in the word in the word in the first of the formal of the word to also on that I work on the formal of the gut it workens there is of the formal of the gut it workens there is of the word to another or word to another than the formal of events one of the another thank of events one of the another of the word to another the another or the country would cook very shake of the one to a technical than the country of the word to work on the word of the or a technical than the word a board meeting affects to give the word of the order when the word a board meeting affects to work on the word of the field of the best offer in my other than the best offer in my other wors foundaments.

got shaky to do the best than con I draw the freely on their un about 12 oclock Eventh but there was a storm owners mean albamy of the God side Charley & Wir Orton the presette Would Vanderbelt, + the other ductors came 'un, 9 had me a oberiff 5 dollars case which of had paid no aftertion to the and had not worked before the present & Kum Y was to have Ironale a neight love my mechining but the Opro were store they pulled me through. The kyork times (get of ) Came out next de

Error of softended the met of was on the kines of the Co we it was very descentful. Ot that the The Jewind Supt of the course of cult of Eckert 2t account there was Orest brietin between Kickert & Orton & Eckert was secretly negatiating with good to laws the Well of take charge of the altantic & Pacific straits hettald me quiver get weather cent but would brug it, I told him of the with the , toaid 9 could not Spatty would agree to That abet of autricky over myshop 10 +12 word of 4 he to bring him over to bee the appoint so the appoint Come over with Mr Juy Hone a This is the first time of hand Ever seen him, I Exhibited &

Explain the apparature they departed of the west day Eakert sent for me + 7 was laken up to gould Rouse which was near the window Hotel, In the Cosement he had an office, was in the Evening alive went in by the servants entrance a Eckut protoky franco that he was watched goved started in at once & Jacksons of how much & would give an affer the he said 9 will give for 130,000, 2000 9 well for that many column was for that many column was V romanhat whom them 9 tho I could get the west morning Oherman Totalingo deffice of Recented a Check for Tologo, with a remark by pones that I had got the section of physics Rock for as he had sold his for 30 ood ahad just a

Three was a big fight on between Genedo Co - the tou, + this Transaction coursed more Liligation The Electrician on a goo unt effethe testing lost his glory he judge niver due de la Cut went cruzy a few mouth In 1876 Estarted again to Experim for the LOU mr Orton, this time it was the lelephone Bell invented the first lelephone which commended coffile present receives cohich was used both as a brumamitter qua receiver, it was altempted to metadian it Commercially Cont failed on account of it fainting the sevenion sound which come Downers Wr Otton wanted me to take hocal of it ormake it Commercial - as I had 6 22m

Smullohenfuly with with Bell of my Levels pretty family or 9- 2000 produced the Contin Fransmiller now uneversally us See Liliquetion on Coloplane Judgelop. Tests were made Getween My 4 Phila also between My & worken long regulow WU wind. The nowand were so great that hut a word could be hem with the Bell grace wor when my + Newark, Mr Ortent ducations Kultinama a Comok Part in the last. The Will This started in to put them on Brunte Lines Mr Theodore Pinokas Tof Buda Posth Hugaray was the

were established, The telephon Dept was put in the as of latemetton Wakan Twomby Vanderbetts word ablest Son-m-low, who made a success afet. The Bell Com Boston also stantart an exchange + the fight was on the low pirating the Bell receiver + The Boston a pirating the WU Travamillad, about this time I wanted to be later care of - 9 I how out hinto of this desire litten Wir Onton sunt for me he had learned that inventors didn't do burnies, by the regular process + concluded he would close it right up, HE topoked me how much I Iwanted, I had made up my must that it certainly was worth 25000 of it ever audunted

to stick to aget obstinate, still it had been an Ease A of felt a little shaky a make an offer, he promptly sand he would give me 100 000, all right y said It's yours on one condition or that you do not pay it all at once rate of 6000 per year for 17 years the life of the potent HE remed only too pleased to do the + it was beloved My ambition was about four alzes too lange for my busin Capholis of knew that I would soon speed they money Expandi for out it all at once so the

fully issued it covered fount, There was no known conf be evaded - its possessor would eventually Contral the Later use of what is Known as the relay + Jounder + they was Notal to leteghy - yourd was Exchange disturbing its advised by his lawyer What this palatel was af great Value Eought it. The moment Mer Outon Theres this he sent for me + Explained the situation I would he to go to work immediately to see of I consider to that could be used in Case for

It seemed a pretty hand job because there was no known means moving a devey at the alter En of a detail when except the use of a wagnet Young young gold that might In Expunding com prisonally of discount of ver that when a piece of well was Commented to a battery was musted over morten of proces of Chack rusting on a metal Comment to the attemp ale that when the Comment of ordhan the the Current was greater unceased over what it was when no current was Cheek rotated by a small El Mutor for the magnet of Comment of Sounder the Consultand claim of Page

in the Electric art, 2 or 3 of the devices were made & leaded by the Comment Expect Mr Orlow Often the had me argue the patent and the Rectant to fife an Wanted to actile for it at prices of game 9 oais maked my prices of for again he named 100 000 occupied providing he would pay it -water of leaves your the 170 This was don't for that period, 12000 yearly for that period, from the Wul The Co\_ after this gone wanted me to help mutall the culomatic agree who attantes of Power's Co. ( which I feel Eakent had 6 seen Electric purchant

automatic Talego Co -Y des a lat of work for this Co making automate a co many of p, at vice and about the time I would a District menonger ence 60x System to gamped a C. called into motace The execus in hefork I had great dufficulty - getting subscriber howing tried reform Convasion who are after the call failed to get subscribers, when & was about to give it up The Lest operator Inamed Parawne who was on the automatic Tela Con war Getween my o washing we want of the of the year of the want of the want of the want of the constant of the want of the constant of the want of the achance of he feet cutain of ability to succeed, HE atal

in the sesselts were surper within a worth he had presence 200 Subscribary + the Co was success, I have never quite ce while the promote small survival The Co was oald out to the Allanhod Parentic -While sugared in pectering in The automatic bystem I saw a great deal of Good or frequent went up to don to his life and to gure during the months of the grand of the grand of the grand of the construction of the con stored time to get cell a free story but he failed to an amy cef stories of had a choide lott I could think a man cute convulsions One afternoon goals started in to Explain the great future of the

Union Precific RR which ka than Controlled he got a map + had some womans combined of stations the kept at at for over 4 hours a got very enthumentic, why he abouted Explain to me a more inventor, with no Capital or alanding I could not make out he had a peculiar Eye of I made up my mind that there was a strain of invanity somewhere This idea was atranglemed whomthe atterwands when the we reason to whouthey resital of the stock Takers bosed had one in his house affice This he had removed because the price had 600m advanced a four doclopers of to his great meone He railed over it. This alruck we as abnormal, I think gould, ouccus was due to abnormal development he certainly had one trait that all men must have who want to succeed HE collected every kind of informatione

all the data his connection with men prompered in official life of which I was aware of was ourprising to many Hip consider appeared to be atrophied to the first that were worse, He worked increasently until 12 to 1 oclock at night He took no pride in building up an Enterprise, he was after money + mo only whether The Co was at succe or a Laulus mostlined not to his after he had hammened the Lever thron he officient too to had Tired out from Contral & Goved went in doughtated his Co + Contracted the WW. The He have reproducted the Contract with the dulomal Teligh people of they me of party Teligh people or they never recome There seem in the court for 25 years wently the federal But

the LOCA I knew that us fluth tragner in letegry was of Towards the latter part of 1875 in the new with slipe I morned the Elevice for untliplying Copies of letters which I ald to Mr a Brick of chicago + in the years since A has been unwireally introduce Collect the winesquephi of also migrated the winesquephi In 1876 Y moved to Mauls Park no on the DRR several miles 62low Re The Course of this more was it to brouse I had agant rent & had rented se success a amale shop on the top floor of

Padlock factory and had rented it by the mouth gare holice that I would give it Keen shortly afterwards I have certal coetta de paper prabation ce fuel quant whom I was to part for you would be to come law it seems that made a monthly rented babble for a year This seems so unjust that I determined to get out of a place that pumits such injustice I moved. In 1877 I wented the phonograph the worth wer brought about in way - I was experiently on authoritic million of second toligh werings on I duck as perfer laid only revoluting plat Tolker has water april

over this was placed a close of paper on Electro magnetic with a paper of point Connected to an arm transport your the description on the magnets who enlessed on the dust of paper Ithen due was the put on an atther sunday was alle brouded with a contact of will Course the signal, to be suggested the owner of war the own the own the said of feter his segment as 35 to 40 correct of mind out with machini Deveral hund words were poundle from u Experients on the talephon I take up sound of a d had unde a little Joy wel collect you Rested looking in the fundal would work a paul Constitute the during

que continuou rotation ullang They pulled was con referencing a mand fairing to them if one shouled waring to her a little land Ite (he por man would start sawing but I magled the Couclesing that I could ream the movements the draphom properly & coul the original movements ungul to the fleogram Get the voiced Deproducing the human voice a Colembia provided with Tim for which saily receive grecorded the movements of the deaph I sketch of the piece work price

I was in the habit of marke the price I would pay on as Dhetch of the workerdu lost Statoh was John Brave tros years become Chile Gymed of the Year Ele it autio collat it has. I total hum that I was got to the Reserro Talking Illie have hereaching talk bo He thought of all my Hower was off which the food put of the food put of the state of the sure of the tree that the supportant that the supportant the supportant the supportant the supportant of the supportant the su

I never was so taken 60 ck in my life Evrybodes was actionish Diference They could be Two soundhing that there was no doubt of - I all might we That worming & took it over to Work + wasted who the office extheo ciculitic among work wato Mr Rede Res deck + sand I had comething new to show hum he asked color it was I tald him I had a machine that would decord arepeadure the human voice, I copered the pockage set up the moch + Rectard Many them & superiored to o of coul continued to o or the

that won Board the results was no that they perobably made they mund beforehand that never could understan + they didn't I multialily started make I exhibited of theulo park to Crowds The PRR ran species Blames neice, members of + henolable people of Come all day long un

made on break I recited Many 66 + another to dity There was a Little Girl a she had a little Cunt ofcolon the was good she was very very good out coolen she was bod the was horrid thouse Ge vienecubered that Senator Roscoe Conferm Then very pronument had a curl onl Corclead + all the Charactured developed it almormally - the was very scuriting about the subject When he came In he was tutraduced cut boung roll deal I don't calal he nam butsut down a stanted the Confecty - Employed littered + 9 was later her C was drap other I other word was received they fresh they be served they be served they be served they would be served they would be served to the served they would be served to the served they would be served to the serve

them & summember Carl Shu who was playing Ch The Exhibition Continued tol plan 1230 am when Mrs Houses Deveral alter Padies than I left at 12,30 am came to the debouting a made Commence to Hearte biblic I am satisfied now there

a man multe Ud who am recite those names with the oar Was cafter my dieturi from the Eclipse of The Offer (you have his religion I want with prof Barber -Zelepen effektedig (you have thin think)

9 word with prof Boules - So with

The prof of Brysis in the

When in the Pa to Chian Flar

Book of Philosophia in Columbia

Colongle to one the Wallace a large manufacture of Brown st allows Com - Wallace at this time was expension serves are lighting for at that time I would to Take Worker surgered that of to work a like of a count of another surgered that of to work a like of a count on tomed by out in andle the translet of the year.

On my return your Petable and well come at aslessed.

Etypical of data asset gas

bought the all the transaction bounded the agence section allows of the gas general section. Its otherwise got all the format at however got all the date in mostingued glow at clear touch in My by a think a grand that the solution of the knoblem of the section of the Rocal and the section of the knoblem of the section of coeth Col- Youra to make a telephone to 68 of the Contenant Con the Briling Po ware and auto Auto Characte to go who started to protry a telephone Godangs whenhe had proceed a fittle way

He was theatened with a law suit Cylle owners of the Bell Hatent. The Bell Co cook stanting on Exchange themselves - Ho Cano more to Contry out the winds of when the country out the would shop without I could Eve de the Petert on the Bock Instrument 3 Balois Manylor & could do po + went right to work - 9 again had become to the Dhonomen discovered by me Typas previous that the friction of a rubbing Electrate lance the the friction varied by and Jelaphone secesses which ceras alterwands Known as The John speaking Telephone or Ralk Jeenewer There was

20

ouse of a Thinkle an arm maked to the cauter and the diashim Extended outwards granted on the chack cylinde that which would be a to a weight of account a la The chack keen hat rained by hand The Valenne at worth terson tacking uti a Conton Framentles in they had his Voice 50 amplified that he Could be heard 1500 ft This great excess of power was due the last What The Hower came from the person the poever as well the received merely Contralled the power just as an Enguer

teent the anchange a all Expert on the exert They were successed & Touled one hundred or more, at the Dame time I was ordered to techinothem to 62 come 17 oct up an Exclan when the Laboratory of go out a get Each one out of a man would be sent To boing 5 menuty Enal he was cont to fordow about 60 man were was to get 20 The Before all had an we The Bede Co seeing that we

find that it was for of was dollars -The went rent conserwance used to Establish Telephone Exal min all aven the Continued of some of them Greams we sattly of was among this around in Lower that Bernand Chair was Employed before he bear own , Lithe Bell has own

enstached by the Courts. Low Chief quete of England are al form, Webster had a marrellow decentified the address before the Courts was lundly trong, May this was from a lungh organism, my Experience of the legalfrationity is that scullefic rand in Vin. Country for a to meripated the eladant of the Expert Correlly or mountain reacted Earl get a blessow in their fator. In England the Judges seem to be difficult thay I are but forted by the Expert. but tear their lesting all to pieces + deande the clase down Expend the different

It seems to me that scientit disputes should be desided Some Court containing at least one or two scientified ment-If justice is Ever to 62 given ad Vinventor Questo aletu eges would not be very as Ito decide a pura compliano to see how a lawyer can decide a compliante el scientific point after factor system ache proport fleen of consell bath are good Federal Courts, There should be a Court of patent appeal with at least two samelifes thereon who comed not be blund to the Daphart Loud Experts men whose whom the Country of Million have been making any money whenly

Career as creators of wealth for Un givened good just because the Expects before the judge by their malesting abstraction Lahier Xwas in Newark the I discovered a peculiar thenous which was unexplanable The Beard of my a promunt ocultific man called It a new force a named of Etheric force, The principle phonomena was shown by breaking the cercuit af a magnet when a spark was pouts in a clark 60x 6 oth power bring shortcurented by a Koop of whe The spork tomed Vicenty of a month of or drawn from gas plan any ethica white Gulder Whatever of and through the isblaced coronit wowed not affect the most delicate detector of Elicha

Electrical yourse, The appointur was about in aperation at the Electrical Exhibition at Paris in thenous but come not que Explanation (get years) year aftermed Herz brought out a paper, wong the dank box & other deviced Theathy Explane the whole matter, which of well ledgly = was found on sketche etc in 1878 at Mento Park I got up a device which I called a Megaphone It considered of 2 look farmer of the shape detormed Expenter Ware were connected together & to a lestening tube the sucho caf

which were insented in the Ear with the motion talking Could be heard a dislance 3 miles -Experients were also muche with Kiter and water coil to endeared to transmit morse arguines to a destince a receive Chem on a lalaplone of the one mile was the greatful distance we could said any without a worse afterme US applied the idea to moving train, to permit sending mesong from a morning to anim to the termina betour on the word, The on the Lehote Valley road wasons for a mula of your on Construction to him. (me lover of con get hunder of control of control for to ships

.

- ----

cipplied the Rebouldage Itus conveyed to wroless telegh with havidous results the Marconi Co purchased me putent Of Menlo Park one Day a farmer Come in a called of I know on connection to know he had 20 acres of patention of the vine work of the connection of the vine work of the connection of the connection of the vine work of the connection of the co quarto of Eng + tried Even Busiephide of Coulon and forms to do it unalough Losot a Drum + went over tot We potato form of sprinkled It on the Vine with a sprinkled The west of the Experience of the Wing Execution When Execution the State of the Willed the Yuman as well, I had to pay

the came into the Laboratory a should in a most prinful Condition he was nearly frozen the asked he was nearly from the love of he might fet by the slove in a few munts he asked for forward, He had a head of Debrormal size with highly utallicheal frature and ver small & Emacialed Cody - H and he want suffermy ve work a solved if had any worth in chemisty that could be ! Cought of total him I had he requested that I give he some bo & got the March supporte, de pomes out Entyle to Kill z men who I total him that we didn't Keep a hotal for sucede

he than bared his legs & drue of they were literally pited with scaro due to the used of hyperdermio eyruges he baid he had I dken it for years + et orequired a bug of let him go when in a sho while he seemed lake another man of commenced to tell Stories, Thenewas about 50 of us sat around listening until morning. He was a man af quest, whelle gone & Education HE said he was a gew but there was no distinctule ment fratme to verify the assertion, "
HE continued to stay around
until he funded Every combatten of Morphine with an acid that I had processing 10 of all tolling have alrychamine, 9 had

on of the sulphite he look everyth to kill a horse to market it has as good Effect on Monphine, I won a good reflect on Monphine, I was gone the only though of the fit was a change of the ch Lid das - about a week after a a Barn at Denth amboy.

#### William H. Meadowcroft Papers Reminiscences by Edison H. Mr. Edison's Impressions of Europe

This document is a combination of original typescript pages and carbon copies. At the top of the first page is an inscription in William H. Meadoword's hand: "Mr. Edison's Impressions of Europe." The document consists of fifteen pages of observations about Europe and Europeans, which were made by Edison after his return to the United States in October 1911. Meadoworoft gathered these impressions for publication, and the scattered corrections and additions to the text are in his hand. Neither a complete original typescript nor an original Edison manuscript has been located.

For the first time in twenty-two years Thomas A. Edison has taken a real vacation. Starting on August 2nd by the Mauretania with his son Charles, he went to England to join Mrs. Edison and their daughter Endeline and son Theodore for an automobile trip in Europe, returning to New York on October 7th. Believing that the readers of Popular Electricity Magazine would be interested in Mr. Edison's impressions of his foreign trip, a correspondent called upon him at his laboratory in Orang. New Jersey, and found the great inventor looking rugaed and well, and although extremely bury, willing to grant an interview.

When asked to mention the most interesting experiences of his European trip, Mr. Edison smiled and said, "That's a large order, and I don't know that I can fill it, but let us begin at the beginning.

"One of the first things I did on arriving in England was to visit the House of Commons where they were holding an all night session and where I saw two votes taken on the Bill relating to the House of Lords. A seat was given me in the Etrangers' gallery. I could see, but, of course, could not hear the speeches, It was all very interesting but there was no excitement. After the House adjourned everyone went out on the Terrace, were I was introduced to a great number of the statessen. They presented ne with a copy of the Lords' Veto Bill signed by Prime Minister Asquith, Lloyd George, John Redmond, John Burns, T. P. O'Connor and others. I was invited to visit the House of Lords the next day but could not spare the time as I had arranged to meet my wife in France.

"Next to Americans the English have the best practical brains. I like the English and admire their institutions and statesmen, and the way the country is run. They are strong on ancient traditions, but they are fast realizing that more hereditary institutions must go. When I was in England a great railroad strike began, but the Government realized that it had a duty to perform to stop disorder, and it acted firmly. Governments are merely huge business concerns, and no allowance for sentiment should be made in their practical dealings with the affairs of the world. In this case England took energetic measures to unsure the right of the individual to work for whatever wages he

pleased, despite the tyranny of labor societies, and I think it is a healthy sign of her basic common sense.

"Motoring through France is a source of unbounded pleasure. I have seen no superior roads anywhere. I travelled over more than 2000 miles of roads there and less than three miles were bad. There was not a rut more than two inches deep. We are far behind the French in this respect, and our American road engineers can get some valuable pointers from France.

"I was disappointed, however, in Paris as the socelled'City of Light.' It bears no comparison to New York in that respect. The Champs Elysees, which is the most brilliantly illuminated street in the city, looks like twilight compared with Manhsttan's Great White Way.' Paris is ever a wonderful city. There is much to interest the visitor, and I took no small pleasure in revisiting the familiar scenes of years ago, but my stay in the city of magnificent prospects was very short.

I did not visit any of the great scientific Institutions, the purpose of my trip being to see the country.

-3778

The historical monuments of Paris do not impress me.

I see them resting on the bones of countless victims of Repoleon's personal glory. Conquest costs; it never page. The Cermans are paid more than a thousand dollars an acre for Alsace and Lorraine, and they thought they had gained it free. Their little merch around the Arch of Triumph was in the end the costliest promenade ever made. The glory of the war lord, wherever he may he, is fading away. There is too much independent thought, too many

newspapers and schools in our present day of civilization to permit of the entiquated methods of these overambitious men who, hiding behind their selfish arms, cry loudly for the glory of their country and force ruin on their people. The terrible price of war would be clear to coming generations if every monument had inscribed upon it the details of its cost to the people. The war game has received a solar plexus blow, anyhow, in the coming of the areoplene. A thousand seroplenes would cost less than one Dreadnought, but think of the frightful effect of a fleet of a thousand airmen dropping nitro-glycerin bombs. Another great international war in Europe seems impossible now so far as I can see. In other words invention has got beyond the thirst of blood; the power of science, that has been let loose must overwhelm aggressive diplomacy. Although Europe has learned her economic lesson, the subject of war seems to be ever in our minds of her people

"But returning to more pleasing subjects than war, let me say that I enjoyed my tour through France. Its beautiful scenery is restful, and its agricultural richness is very impressive. I was amazed at the beautiful crops of wheat, barley and other small grain. There were no such extensive fields of one kind of grain as we see in our western states, but cultivation is done in small acreages. A few acres of wheat, with a similar patch of cats adjoining it, and so on, but all in the highest state of perfection. The formers are successful and well to do, and, it was not difficult to discern one reason of the wealth of France. The vast vineyards were particularly interesting. Unfortunately it did not happen to be the time for gather-

ing the grape crop. I would like to have seen it, for I understand they make a great holiday of the occasion.

where

we went on our motor tour we found the people apparently happy and contented. They have savings in plenty, but they put the money out in Seven-west fewbo.

A Seved-grainterest. Land investments with them are practically nil.

I was struck with the lack of new buildings going up. The peasants are certainly geniuses in making the most of a tiny strip of land. In one small farm I counted no less than seven different kind of crops.

The apple orchards of Normandy astonished me by their wonderful crops of ruddy apples as-dim-onest-we-have.

"The French bread struck me as particularly good. It was palatable and nutritious and I ate a great deal of it while in the country. The French are wiser than we in not seeking to make their bread deszlingly white by scorificing the nutritive parts of the wheat. Their skill in cooking is apparent everywhere, for even in the smallest villages everything that was served had the magic of their art.

"Switzerland is a country of magnificent scenery and practically unlimited power soing to waste. In motoring it is quite a change to leave the beautiful French roads where one can speed and get into Switzerland where sixteen miles an hour is the limit. The people are progressive but lack the daring in business that is characteristic of the Anglo-Saxon. They are hampered by over-prudence. In some respects they remind me of the Japanese, for their genius shows itself in minute sorts of labor. They are a little people in a little land. As far as I can judge, they are more intricate in invention than in mind. Their watches, clocks, music boxes, wooden toys, and what not, — everything is little. We showed them how to make Genava watches by machinery, and now they are imitating us in their own country. But occasionally a great engineer will arise among them. One is my friend Turitini, who constructed the great power works on the Rhome.

"Cheap electricity is waking up Switzerland, and there are some signs of growth. You will find new buildings going up, which cannot be said of all the countries in Europe. It is to be hoped that the Swiss will soon be so thoroughly awakened that the dreadful spottacle of women harnessed to the plows, yoke-mates with cattle will be a thing of the past.

"Bohemia was a surprise to me. I had not expected to find much progress there but was agreeably disappointed. New construction was in evidence not only in the larger towns, but even the smaller towns are extending somewhat. Most of the old houses are built up to the sidewalks and there are no gardens or lawns in front, but the modern houses are different, and one sees flowers in the front yards. Perhaps this may be due to the influence of Bohemians who have returned to their country with a competence made in America, and have taken American ideas with them. There is a general tendency in Bohemia toward commercial and manufacturing development on a larger scale than ever before. Many factories are in course of construction. But the country is at present handicapped by ill-feeling between thelaity and the Church, which must work itself out before any great progress can be made. I was struck with the fact, here, as elsewhere, that the European farmer makes more out of less promising land than ours by intensive farming. Over there they spend their time and energy in carefully cultivating small areas instead of crudely cultivating

large areas as many of our farmers do. Nothing in the way of land

goes to waste in Europe. Even the roadside is lined with fruit trees. principally apples, then come peams, then cherries. Minety-nine per cent of such land goes to waste with us. The Bohemians grow great crops of apples. I coloulated that there must be at least 250 square

-8-

miles of the country devoted to apple growing. Their fruit is not as good as ours, however, being smaller and mostly used for the manufacture of champagne, vinegar, etc.

"In travelling through France I found myself looking always for the nation's factories but generally in vain. Of course, she has her factories and plenty of them, but her manufactures, generally speaking, are artistic in nature, high in value and small in bulk. Hence, they do not require large machinery to produce them. On coming into Germany one immediately sees evidence of its being a great industrial nation. I saw more factory chimneys in the town of Chemnitz alone than in the whole of France.

"It seems like a humiliating thing to say, but it is the fact that Germany's manufacturing industries are pushing shead much faster than ours are. The growth of her manufactures is constant and tremendous.

"Thousands of factories are in course of construction.

I saw many factories in North Germany, and whether they were built or in building, the construction generally speaking was better than the construction of the best of ours. Their building methods are extremely sensible, economical and effective. They use cement more freely and more wisely than we do. One sees everywhere buildings of loose stones faced with cement which fills in the interstices.

"Every detail of factory construction over there is hedged about by carefully restrictive laws which are rigidly enforced. The consequence is well built buildings, safe, senitary admirable. There is very little danger of fire in such buildings. I was told in Prague that the city's fire loss in one year was only \$26.000. The fire horrors which are continually occurring in America are impossible. The construction of the buildings is such that the workmen's health is carefully protected; they have fine light and air, and in the arrangement and management of the machinery they are carefully protected against accident. We have many things to learn from Cermany in these details of factory equipment, construction and management.

"When our American people realize that the average depreciation on an average building

is 5 per cent as against one-half of one per cent in Germany, they will wake up and throw saide tradition and take a lesson from our German friends who make liberal use of cement as a building material. We are apt to think of them as heing slow and conservative. They are certainly conservative, but in that respect they have forged ahead and made heste economically.

"Germany is up to date in all branches of mechanical and scientific advance. She is not bedind us in these lines,
generally speaking, although her shops are full of American machinery or imitations of it. I went through two great electrical shops in which 55 per cent of their machinery was American.
This illustrates the good sense of the Germans. While Germany
is the most scientific of all the nations, she does not approach
us in applied science. She is pre-eminent, however, in some
lines. In mensical industries she stands alone. Ret, here,
tgesis, here chemical-laboratories—and factories—are full-of
American machinery. In automatic labor-saving devices of all
kinds and in their condication we excel her.

"The Germans are the world's most persistent people. They usually get what they are after, and they have started now to capture our mechanical prestige. If the United States is to prevent them from outstripping us in the race, we shall have to get down to hard, intelligent work.

"The German dessetto trade is enormous, but from indications in the packing rooms of several large German factories which I visited, I should say their foreign trade is still larger. They are organizers of great ability and extraordinary

patience and are wonderfully energetic and intelligent. Not only are they fighting us for the world's trade, but they are also fighting England wherever she has business that they want, and they have engaged in a persistent compaign for the world's business. This compaign is not sensational, but there is no slackening up of it. If we are going to hold our own or win out, we should watch them closely, for there is much in their methods that we

could learn with profit.

"They have gone so far as to establish benks with German cepital in all parts of the world for the purpose of assisting resident German merchants, thus Germany not only exports goods and makes the profit from their sale abroad, but furnishes the necessary banking facilities, also highly profitable, through which the business is conducted in the residual of the sales and the sales are sales as the sales are sales are sales as the sales are sales are sales as the sales are sale

"Another thing in Germany impressed me greatly, and that is one great advantage which their manufacturers have over us and every other country. I refer to her great promoting banks. In our country a man desiring to put something new on the market must have a promoter of his enterprise, and our promoters are notoriously irresponsible. In Germany inventions are brought out by the promoting banks.

"For instance, The Deutsche Bank, which is one of the largest banks in the world, has a corps of engineers and auditors ready to investigate any proposition. An investigation if taken to them. If after most cereful investigation it proves likely to be useful and profitable, the money to push it is fruthcoming. The financial and technical investigation is rigid, but if the idea stants that test, the capital is ready.

A manufacturer wishing to extend his business can slow get money in the came was promptly at a reasonable interest if he can prove that his proposed extension will be profitable. It saves time and keeps him out of the clutches of sharks.

"A good part of this plan is that the bank will carefully watch the progress of the invention at the manufacturer, and will place issignment on the Exchange, and when it

rell the shares & has arrived at a certain point of prosperity, will take its

a fair profit for its use. This money back, che leaves the inventor or the manufacturer with his invention on factory in his own hands to proceed alone without encumbrance. This shows the wisdom that the Germans exercise in providing the utmost encouragement to their inventors and manufacturers, and I predict that it will soon put the German Nation in advance of us in the origination and development of new mechanical ideas.

"I believe I see the true inwardness of the Emperor's unwavering naval policy. He does not want war; no one wants it less. But he apparently considers a large navy a good business investment. It insures protection to German capital invested in the remote parts of the world, as well as to German merchants whever they may be. Hence their navy may be looked upon as a commercial proposition, and its cost as (Jako in extra page) insurance premium.

"I found my trip through Europe most interesting and instructive. It was made mostly by motor car, so we really saw the countries we went through, and really came in closer contact with the people who live in them than if we had travelled from place to place by train. I am well satisfied, however, to get back to my own country, for I did not see any country on the other side of the ocean that can compare with the United States, if considered as a whole.

"My visit to Berlin was exceedingly interacting, I had not been there for twenty-three years, and the city had grown almost there for twenty-three years, and the city had grown almost the correlating growing with Ohioago Chicago of Smrope and it is correlating growing with Ohioago speed. I have good reason to be interested in Berlin, for it is the center of electrical industry in Europe. The greatest of the electrical works, the Allgemeine Electricitätis Gesellandari, is there, and is operated under the direction of my old friend hall Ratheman, employing about 50,000 workmen. I feel a cort of paternal interest in this works as it was practically started by me, and once bore my name.

"Another of the great electrical works in Berlin is owned by another of my old friends, Sigmund Bergmann. He started his electrical life with ne by working at the bonoh in my Newark shop about forty years ago, and later on made carbon transmitter telephones and phonographs, and afterwards became my partner in manufacturing the detail apparetus for the electric light system. His shrewfaces and ability kept him ahead of the procession in this country, and he has kept up ahead of the procession in this country, and he has kept up the country of the country which were he employe about 12,000 workmen and makes everything electrical.

"Still another of the great electrical shops is the one established by Schuckert, who also worked at the bench in my Hewark shop with Bergmann, leaving my employ to go to Germany to settle up his father's estate. He stayed there and took up the manufacture of electrical apparatus and established the great works that bear his name, and in which many thousands of workmen are employed. He died immensely wealthy, but the works still go

"I was much impressed with the great progress Germany & is making in electrical manufactures and in the use of electricity. The people use electric light with great liberality, for they can your outrent very cheaply. I me total clearly light is used so make the control of the control light in the cheap they can be sufficiently in the cheap they can be great the cheap they can be sufficiently and the control of purposes." The progress of the control of the co

I also visited the growt shope of the Siemens-Halska

Siemens - Schnetzers works . that is used in the electric light and priven

fields, but also an immense variety of fine instruments

apparatus for philosophical and other purposes.

(Then take in East paragraph on have 12)

The people use electric light and power with great liberality, for they can buy current very cheaply. While there are many important manufacturing plants throughout the country, Berlin is distinctly the electrical center. The importance of the electrical industry to Berlin may be readily appreciated when it is realized that at least one-sixth of that city's population id directly or indirectly dependent upon it for support.

"I found my trip through Europe most interesting

and instructive. It was made mostly by motor car, so we really saw the countries we went through, and really came in closer contact with the people who live in them than if we had travelled from place to place by train. I am well satisfied, however, to get back to my own country, for I did not see any country on the other side of the ocean that can compare with the United States, if considered as a whole.

#### WILLIAM H. MEADOWCROFT PAPERS REMINISCENCES ABOUT EDISON

This folder contains reminiscences about Edison by his associates and employees. The reminiscences were collected by William H. Meadowcroft during the research for the biography, Edison: His Life and Inventions, by Frank L. Dyer and Thomas C. Martin. Some of the reminiscences are arranged alphabetically by author: William S. Andrews, William G. Bee, Charles T. Hughes, Samuel Insull, Edward H. Johnson, Walter S. Mallory, and Francis R. Upton. The Andrews material includes several letters pertaining to a meeting of the Illuminating Engineering Society in 1907 at which Edison and his early electrical work were recalled, along with the transcribed minutes of that meeting. Reminiscences subsequently published by Edward G. Acheson and Francis Jehl have not been selected.

# **WILLIAM H. MEADOWCROFT PAPERS**

REMINISCENCES BY WILLIAM S. ANDREWS

M. W. S. andrews. Men

PERSONAL.

Schenectady, N. Y., April 4, 1898.

Mr. E. H. Mullin,

New York City.

Dear Mr. Mullin:-

I was pleased to receive yours of the 30th ult., and should be glad to exchange notes with you occasionally on topics of mutual interest.

Mr. Edison was in Sunbury, Pa., in July of 1883, for about a week or ten days supervising the starting up of the first three-wire Central Station for commercial electric lighting, and I then learned from him a great many of the terms relating to this business that have since become standard. The words "feeders", "mains" and "services" are, I believe, original with Mr. Edison as applied to an electrical system of conductors, although they may have had previous applications in the gas industry. He also originated the compound word "bus-bars", so named because all the feeders are connected to these bars; also many other terms which do not just now occur to me.

I went to work for Edison in 1879, and in the latter part of this year or the beginning of 1880, I helped to build the first low tension bipolar generator of his invention. I remember that he started with the idea that the armature should

be of very low resistance, contrary to the commonly accepted ideas at that time, and there was quite a spirited controversy in the Scientific American between Mr. Weston and Mr. Unton. who was one of Mr. Edison's assistants. If my recollections are right, Mr. Weston maintained that to get the highest economy, the resistance of armature should equal the resistance of the external circuit, in accordance with the prevailing practice in series battery work; whereas Mr. Upton argued on Mr. Edison's assertion that the resistance of the dynamo armature could not be too low, and the lower it was, the greater would be the efficiency of the machine. This incident goes to prove how thoroughly Mr. Edison had grasped one of the fundamental requirements of the shunt wound dynamo even at this early date. We worked a great deal by guesswork, however, in those days. I think we wound the field magnet of our first

dynamo with No. 10 wire, and then wondered why the field absorbed all the current that the amature could produce. Then we put a lot of external resistance in series with the field circuit, but that scheme cut down the magnetism too much. The fact then became apparent that the armature rule worked inversely in the case of the field magnet, and the resistance of the letter could not be too high, providing the magnetic field was strong enough. The field magnet was therefore rewound with smaller wire, and as the machine then gave better results, we tried still smaller winding, and so at last, after several trials, we secured fairly good results. All this work was

done without any rule or precedent to guide us, and I believe Mr. Edison simed to get about 100 volts at the brushes.

Then all kinds of different incandescent lamns were made with filaments of card-board, wood, pressed plumbago and all sorts and conditions of carbonized vegetable matter. It was soon observed that when lamps burned too brightly their life was short, and when the carbon was too rod the light was unsatisfactory. By and bye experts began to make lamps so that they lasted pretty well and still gave a fairly good light. It was then found that we were running our lamps at about 110 volts, and at this voltage the lamps as then made appeared to give the best average of light and life. 110 volts thus began to be recognized as a nominal standard for incandescent lamps, and after a time it became universal for Edison lamps. Subsequently we made 55 volt dynamos and lamps. The 110 volt machines and lamps were also for a time designated by the letter A. and the 55 volt machines and lamps by the letter B., but these designations were only temporary, and the 55 volt system was not extensively used in connection with Edison work.

We had a great time with that first dynamo! Edison was so interested in it that he would hardly take any sleep himself or let anybody else do so. I remember that I worked fifty-two hours without closing my eyes, and then went to bed and slept for about fiften hours without opening them! Edison used to say that anybody should be able to work all night and the next day without feeling very tired. If one worked through

the second night, a slight "tired feeling" was pardonable, but any healthy man should be able to do it and also continue work through the third day; then take a good rest the third night, and wake up next morning all right again. I tried this once, but did not get rested for a week afterwards, so suppose I could not have been in the enjoyment of good health at that time! I really believe those old days it Menlo Park were the happiest in my life. The constant excitment, the appreciation of the fact that we were working on something entirely novel, the continual development of new ideas and the ever recurring query - What next, - all combined to keep one in a perpetual thrill of expectation, and after all, to philosophize a little. I think there is generally more pleasure in anticipation than in fulfillment!

I could ramble on in thid desultory manner almost indefinitely, but must change the subject lest I tax your time and patience too heavily. Mr. Meadowaroft

NOTE: Written in pencil This front page was so crumpled and torn that I had to have it re-typed verbatim. W.S.A. (Written about 1907)
By M.S. Aude

# A SHORT ACCOUNT OF THE FIRST UNDERGROUND SYSTEM USED FOR INCANDESCENT LAMPS.

In 1880, Mr. Edison laid out a system of underground distribution, oversing a radius of more than half a mile from his laboratory at Menlo Park, to supply about 1000 lamps, placed on wooden lamp-posts along the streets and roads of the village of Menlo Park, and also in the dwellings.

As no electric lighting circuits had ever before been placed underground, there was absolutely no experience to guide in the proper laying and insulation of the conductors. Mr. Edison believed that the low pressure of 100 volts would not cause sufficient leskage to demand expensive insulation, so the bare copper conductors to be laid in the earth, in very case to be laid in the carrieding, (such as is today used for interior ligating), with the usual coverine board.

These conductors were composed of No. 10 B.W.G. copper wire. The large conductor was composed of twenty-five wires at the dynamo room, and it tapered at the end, (about helf a mile distant), down to one No. 10 wire. The system was a simple, two conductor, multiple circuit, without feeders. Lamps were tapped from these conductors at the base of each pole, end in front of the dwelling to be lighted.

The complete system was laid and covered with about six inches of earth, before it was tested. The test consisted of turning on the current, with the result that the line was found to be practically short-directed by excessive leakage throughout its entire length, as predicted by one or two of the old telegraphers employed by Mr. Edison as assistants.

An attempt was then made to insulate the system by pouring coal tar into the grooves of the molding. For this purpose the trenches were uncovered the coverings removed from the molding, and a liberal does of the coverings removed from into the grooves where the wires lay the coal ter served hot into the grooves where the wires lay the coal ter served hot insulation was taken before an attempt was made to stort the system, and it showed that the insulation resistance was too low for practical purposes. Mr. Edison's chemist them discovered that the coal ter contained sufficient acid to destroy its insulating properties

The next step was to experiment on one main. This experiment consisted of filling the grooves in the wooden moulding with a plastic composition made of powdered slate, and a binder which was discovered afterwards to be coal tar. This

insulation also failed for the same reason as in previous trials, anamoly, acid in the coal tar; and another experiment was undertaken, which consisted in serving the conductors with marlin, closely wrapped on by meens of revolving spools, similar to those used today for insulating wires, athough on a different scale.

After this experiment had proved of insufficient utility, Mr. Edison confessed himself to be tired of haphasard trials, so he requested Mr. Wilson S. Howell to go into a graph read up on the subject of insulation and insulation that the such as resins, gums, oils, etc., and report to him in two meeks, with a list of promising insulating materials, which would be cheap enough to use on a large scale. When this report was placed in Mr. Edison's hands, he directed Mr. Howell to purchase what he thought proper of these various materials, with a supply of pots and kettles for making compounds, and installed him in his chemical laboratory, with orders to produce a cheap and effective insulating moterial.

He status that Dr. Otto A. Moses, who was Mr. Zhison; chemist, was nearly driven to district on by the stanches and smoke of the cooking of the various insulating compounds in his laboratory. The experiments were made on lengths of 100 feet of No. 10 copper wire, and when a promising compound was produced, this wire was served with the compound, held in place by muchin tape and after coiling into a tank of water, was tested to insulating properties, as long as the insulation would stand

After a few weeks of these experiments, the best of the insulating compounds was selected for use. This compound was composed of refined Trinidad asphaltum, mixed with oxidized linseed oil to give it the right consistency, and a little peraffine and bessexs were added to make the material smoother. Two or three tons of Trinidad asphaltum were bought, with a few burrols of linseed oil and litherge with which to oxidize bessexs. We were a bales or cheep muslin, and some perefrine and bessexax.

Two 50 gallon iron kettles were mounted on brick work, and the compound mixed in these kettles. The muslin was torn into strips about 2-1/2 inches wide for the largest conductors, and passed through the compound while hot, and made into balls, to facilitate the winding of the conductors.

The conductors were again pulled up from the trenches, and lifted above the earth on short sew-horess. The method of winding was necessarily crude. A small boy straddled each conductor, walking out towards the end of the conductor, as he served the insulating tape carefully thereon. After he had present the property of the served the served to the conductor, as second boy was started out with meeting the conductor, as second boy was started out with meeting the servings of tape were put on each conductor, which was then haid back

into the trenches, the wooden molding having been removed. Each line was then tested, and the insulation was found to be remarkably good.

The first line completed was the one that led from the dynamo room past Mr. Edison's house, and along the Pennsylvania Railroad tracks.

It was on Election Day, 1880, that Mr. Howell informed Mr. Edison that this line was completed, the lamps in place, and everything ready for starting up. His enswer was characteristic, "If Garfield is elected, light up that circuit. If not, do not light it,"

Several of Mr. Edison's assistants gathered that evening with him in his Laboratory office to receive the returns.

Mr. Edward H. Johnson was at the key, which was on a loop run from the telegraph line along the railroad tracks. Careful tally was kept of the returns, and when the result seemed certain, Mr. Edison gave orders to light up the circuit, which ran for about a mile along the railray tracks. Steam had been kept up, and everything was in readiness to start the machinery, copy and the control of the con

This system of underground conductors maintained its insulation throughout that winter, and was in good working ordwhen abandoned the next year, at the finish of Mr. Edison's celebrated demonstration of the efficiency of his incandescent lighting system, and the feasibility of operating underground electric lighting circults.

The insulating compound prepared for this first underground system was used with practically no alternation, by the Edison Tube Works in the manufacture of the Edison Underground Tubing, and it is practically the same composition as that which is employed today for this purpose.

Apr. 20, 1909.

W. S. Androws, Esq., Gomeral Electric Co., Schemootady, N. Y.

My doar Mr. Andrews:-

For a year or more I have been endeavoring to get a cony of the Minutes of the discussion which took place after your historical paper was read at the mooting of the Illuminating Engineering Society. I finally succeeded, and have two or three copies after preserving what I need for the Board's library and my personal collection; also one for Mr. Clarke.

I dislike to put you to any trouble about it, but it goess to me that your impromptu romarks, between the paragraphs of your paper se originally road and printed, contained several statements which ought not to be lost and which were not taken by the etenographer. I recall, for exemple, some of your more or less facetions recollections regarding the way in which the railway conductors were laid down at Menlo Park in 1880; also I presume the conductors used for the illumination of a large area at that time. I think you will readily call to mind the points on which you thus enlarged in this second address. Very likely you made some memorandum of them on your notes which represented what you had said at the meeting of the Edison Elluminating Companies.

My suggestion is that your stories and contributions to himtory regarding the work done at Menlo Park might be briefly restated in a letter to me or to somebody else, a copy of which could be filed with the stenographor's notes of the discussion.

I think you will appreciate my suricty to resone the little

# COPY

WSA--S

incidents and what now appear to us the unaccountable things which occurred at that time, before they disappear from your mercry and that of others who are now able to tail the story. In Mr. Meadow-croft's work on the life of Edison he is endeavoring, as I believe you underntend, to embalm all such encedates and torse illustrations as will bring in the human side of Edison's inventigations and discoveries. Quite likely you have contributed conching to him stock of interesting reminiscences of this sext. If you have not, you ought to do so. I urged upon him the other day the great desirability of submitting to you end a few others who are evailable, the first draft of the chapter on Electric Lighting and Fower Distribution. Be said he fully intended to do so. The object of this reference to the matter is to make certain that you do not loss the operativity of adding something to what he can get from others. I believe he intends to cond the manuscript to me before a great while.

believe he intends to send the manuscript to me before a great while we are not seeing much of each other. I hope you will call whenever you can.

Yours very truly,

Meeting of the New York section of the Illuminating Engineering Society held at the Engineering Building, New York City, Thursday evening, November 14, 1907.

Chairman Forstall called the meeting to order at 8:30 o'clock and said:

The meeting will please come to order. It gives me pleasure to see that the President of the Society is with us this evening, and I think you will join me in requesting him to preside over this meeting. Dr. Sharp, we will be very pleased to have you take the Chair.

Dr. Sharp took the Chair and said:

It gives me great pleasure to introduce to the New York Section of this Society one of the first and one of the most distinguished of the gentlemen who were connected in the early days and who are still connected with the electric lighting industry of this country. Before a distinctively electrical assemblage it would not be necessary for me to rise to introduce this gentleman to you, but since this society represents all kinds and methods of illumination, and all the sides of the art of illumination, and science of illumination, there is a certain appropriateness in my presenting to you this evening Mr. W. S. Andrews of Schemettady.

Mr. Andrews then delivered his address:

President Sharp: Gentlemen, we have listened with very great pleasure to the remarks of Mr. Andrews, and I am sure that I am voicing the sentiments of every one present when I say that we are deeply indebted to him for coming down here and presenting this address to us. I hope that we next may hear from a number of those who were associated with Mr. Edison and with Mr. Andrews in this early pioneer work which has led up to the developments which we see at the present time. To introduce this discussion, I will take the liberty of asking one who has been identified with this work from the very start and who is still in a position to view the whole field of electric lighting and of the electrical industry in general, Mr. T. C. Martin:

Mr. T. C. Martin: Mr. President and Gentlemen: While I believe I can claim the honor and distinction of being the Gldest Edison man in the room, not by virtue of years, but by length of connection, that very same privilege unfortunately denied me the opportunity of being as closely connected with the introduction of the art of incandescent lighting as now I could wish; but it is impossible, I believe, to be connected in a pinneer capacity with every great art as it comes along. We do not make the selection for ourselves, Providence has a hand in it. My Work with Mr. Edison in connection with the phonograph and automatic telegraph, telephone and other inventions during the closing period of 1877, the year 1878, and the earlier period of 1879 had so far used up my youthful energies that I was very glad during

Fall of 1879 to seek rest and recuperation in the West Indies, allowing my successors an opportunity to distinguish themselves in their field.

It was during 1879 that we began to hear the first whispers and murmurs of the coming tremendous development in incandescent lighting, of which we have had so admirable presentation tonight from my dear old friend Mr. Andrews, to whom my departure from the scene may perhaps have given a better opportunity than he otherwise would have enjoyed. I have been very much interested in traversing this history with him tonight and hearing him rehearse with such accuracy and yet with so much modesty the part which he himself has played in this great flourishing development of an art to which the world already owes so much. I was particularly interested to hear him give some statistics which I myself had the privilege of preparing for the U. S. Census. Office, namely, that five years ago the development in incandescent lighting and arc lighting represented a capitalization in this country of \$586,000,000. That amount, today in the five years which have elapsed reaches closely upon \$1,000,000,000, and yet I could not help recalling, as he threw upon the screen tonight the picture of the steamship Columbia, the very interesting fact that the paper filament lamps which were placed in that installation were taken on board the steamer by my old friend Frank Upton in a market basket. Today, as I see the wagons of the New York Edison Company perambulating this City laden with lamps given away

freely to some seventy thousand customers, I cannot help thinking of the tremendous and wonderful development which has taken place in the incendescent lighting field, which is represented by the total consumption in this country alone of 250,000,000 incandescent lamps up to date.

I think at this stage, Mr. Chairman, I may be permitted to leave to those who have actually taken part in the development of the art, to continue the story part of which I have endeavored during the last twenty-five years to record as a mere historian.

President Sharp: In Mr. Andrews' remarks he spoke of a certain direct connected unit, as we call it today, in which the engine made very extraordinary speed in revolutions per minute, and said that Mr. Clark could tell us something about that engine. I should like very much if Mr. Clark will favor as with some remarks on that engine and other things.

Mr. Charles L. Clarke: I remember distinctly the engine during the length of time it was in service. Charles T. Potter, an eminent designer of high speed stationary engines, undertook to make for Mr. Edison an engine of unusually high speed, much higher than he had before attempted, and entered into the work with all the well-khawn enthusiasm and ability characteristic of the man. The engine was, as Mr. Andrews has said, designed to develop about 100 h.p. at 600 revolutions; under the very high steam pressure for stationary engines of 180 lbs., 60 to 80 lbs being considered a high pressure at that time. Edidon built the dynamo which was a very large one

for that period, and adapted it for direct connection with the engine. Both engine and dynamo were mounted on a single heavy cast-iron bed plate, which was firmly bolted down on a large brick and cement foundation that nothing could move. In fact, it is there now; hoodlums and tramps have taken away almost everything else that was left in the establishment, but the foundation remains. I remember distinctly the night steam was first turned on to the engine -- Edison was there, Porter was there and John Kruesi, Edison's mechanical engineer, and in later years mechanical engineer of the General Electric Company, was also there, likewise Batchelor, Upton and other assistants of Edison, who afterwards eminently did their share in developing the art of incandescent electric lighting. Mr. Porter, of course, could not admit he was afraid of his own work, so he was willingly given the privilege of turning on the steam. In designing the engine he had naturally been obliged to depart from usual practice in so many respects that it was not to be supposed the governor could be adjusted beforehand to hold the engine at the desired speed; this was a matter for experiment. He kept opening the throttle and looking at the governor to see it rise. By and by it rose, but not until the engine was going with a vengeance, and the hair of most of those in the room was rising and the place was rapidly being evacuated. Nothing, however, would scare Edison; he remained, and also Porter and myself -- I was young and inexperienced, and simply did not know enough to be afraid - - I thought that was what a high speed engine should do -- go fast and make a

big noise. It sounded like an immense drop-forge foundry, with ten thousand hammers in operation, that is about the best way I can express it. Porter said -- "Let us take the speed, Clarke." I replied "all right," and held the speed indicator, while Edison held the watch. The reading showed that the engine was making 750 revolutions, per minute. The link motion, within the limits of its movement, looked simply like a triangular shaped bit of haze or fog, and a newspaper could be read through the crank rod. Although the engine did not heat up, and the trial was a success in many respects, it was decided before the test of that evening was over that the speed was too high for safety, and the engine was condemned as far as its use for the purposes intended were concerned. Afterwards the engine was operated for a short time at 350 revolutions per minute, in order to experiment with the dynamo to determine its electrical characteristics. But the idea of operating engines at such a high speed as 600 revolutions per minute was dropped, and larger engines of the same power, at 350 revolutions, were adopted, at the Pearl Street station and elsewhere, as mentioned by Mr. Andrews.

Chas. L. Clarke.

President Sharp: If Andrews has referred to another gentleman who was prominently connected with the installation of the first New York station, and who also was the first to carry the Edison system to the Italian Feninsula. This gentleman is still lighting New York by electricity, and has favored us with his presence this evening. I hope we may hear from Mr. Lieb.

Mr. John W. Lieb, Jr.: Mr. Chairman and Gentlemen:

I am sure these pictures which Mr. Andrews has presented and his interesting remarks have called to the minds of many of us interesting experiences passed many years ago in the pioneer days of the industry.

In some of the developments of the early days in connection with the commercial applications of the electric lighting systems we did not profit by experience along similar lines that was available and in starting up some of the stations they were operated without any ammeters or voltmeters, although such instruments of more or less practicable types were available.

One of the most remarkable things in connection with the whole development of the industry is the fact that so many features which have become recognized as essential parts of all commercial lighting systems had been well thought out by Mr.\ Edison, so that when his system was finally perfected there was available a complete and practical system including the engines,

dynamos, regulators, underground system, wiring, safety devices, meters, switches, sockets and the lamp itself.

President Sharp: We have the pleasure of having with us tonight a gentleman from the other side of the water who has already made himself heard for a moment regarding the "Jumbo" which was installed in the Holburn Viaduct Station in the early days. I wish that we may hear from Mr. Stewart.

Mr. W. N. Stewart: Mr. President and Gentlemen: I thank you for the invitation to participate in this discussion. This is the first time in my twenty-six years that I have been privileged to gather with a lot of old Edison men, and it gives me great pleasure to be here on this occasion. I left Goerick street in 1881, the proud possessor of one of these d jumbos which Mr. Andrews has shown us, and a vast fund of inexperience, which would fill several books. I made an exhibition of the jumbo in the theatre in Santiago, Chili, and on the first evening when the theatre was filled with the aristocracy of the town, I discovered to my horror the binding wire around the armature was slowly stipping off and going to pieces. We had no means of boring out the field magnets, and we cut grooves in it. I think the machine is still running. The result of the exhibition was the establishment of a central station in the following year, 1882, which consisted of eight K dynamos.

I have followed the careers of the old Edison men with pleasure and interest, and rejoiced in their successes and

the reputations they have made, but I, too, can claim a reputation in this business. I claim the reputation of having installed and operated the worst Edison central station ever known in the history of the business. I am not proud of that reputation, but I think no one can challenge the fact. With these eight K. dynamos we had four belts between each engine and the dynamo. The steam pressure was limited to 75 pounds per square inch. We had two-wire underground feeders, sent without any plans or specifications for their installation; the station never had an ammeter or voltmeter, the station pressure was registered by a galvanometer; we were using coal costing \$12. a ton, and we were paid for our light in currency worth fifty cents on the dollar. The only thing that I can be proud of in connection with the plant is the fact that I did not design it, and once in a while we made out to pay its operating expenses, and occasionally we could run it for three months without a total breakdown.

Since then you have seen great improvements, everything has advanced, and I want to say to the young men here tonight, that while perhaps they think they have not the opportunities the older men had in the beginning of the business, I want to show them that the chances are today greater for success. We had to do our work by main strength and awkwardness—there was no skilled attention—no attendants, no stience about the business, everything new and untried; we did not have the mental equipment, the training which the young men have today,

and therefore I say keep on with the improvements.

Yesterday we thought the reciprocating engine was the end of all things, today we use the steam turbine, and tomorrow we may have the gas turbine. There is always room at the top for young men, but one thing will not improve, and that is the magnificent esprit de corps and spirit of fraternity that existed among the old Reisen men. I never knew one of them afraid to turn his hands to any work, no matter how dirty, or who failed to assist a brother in distress or give him the benefit of any knowledge; and I hope the young men will perpetuate that spirit. As I go to my distant home in a few days, I shall remember my visit here tonight with great pleasure and I wish you all God Speed.

President Sharp: In connection with some of the early work done in illuminating engineering with the incandescent lamp, when it was really in its infancy, I think we should be interested in listening to what we may hear from Mr. Howell.

Mr. Wilson S. Howell: Mr. President and Gentlemen: In looking back at the old stations that had no means of regulation, no indicators, no voltmeters or ammeters, it is wonderful to think that the Edison lamp was so very good as it was. It did not get the credit for it. The stations were run at all kinds of pressures and with all kinds of results from the lamps. Some records of life were very high and some records were very low. I remember complaints that used to come in from the station managers to the Edison Lamp Works when I was a station manager in those days, that the lamps were rotten, no good, and at one meeting of the Edison Association, away back, the manager of one of the largest stations in Pennsylvania -- Philadelphia was not started then -- got on his feet and condemned the Edison lamp as rotten, he said it would not live 200 hours, and the tirade against the Edison lamp amused me very much. I do not know what possessed me to do it, but I winked at this gentleman, and that encouraged him to believe that I had some experience of a similar character in the little station in New Jersey which I was operating at that time, and before leaving the floor he said that he knew that Wilson Howell would back up

what he said about the rottenness of the Edison lamp. Well, I could not. I acknowledged when I got on my feet that I had not had the same results, that my experience with the Edison lamp in New Brunswick, N. J., had been quite the opposite, but that I had paid extreme care to my regulation and that I had secured considerably over 3000 hours average life for my lamps. I had no sooner taken my seat than our worthy Pennsylvania friend jumped to his feet and said that it was easy to account for the rottenness of the lamps in his town and the excellence of the lamps in my town. He said: Gentlemen, the man who runs the New Brunswick station has a brother in the Lamp Works. Mr. Edison was at the meeting and interested in the account which I gave of getting such a long, satisfactory life from the carbon lamp, and before I left the meeting he asked if I would not tell him how I got it. I told him that I regulated the pressure very carefully, and that I was at that time running ten candle power lamps at 16 candle power, and getti ng an average of over 1,000 hours from those lamps. He asked me if I would take 100 lamps which he would specially prepare for me , and make a life test of the lamps. He made a lot of fine lamps, as fine as we had in those days, and I ran them day and night at 16 candle power and got over 600 hours average life out of these lamps and that was the first try out of the so-called new type high efficiency Edison lamps of 3.1 w.p.c.

President Sharp: We have with us tonight one of the early Edison men who has distinguished himself in many electrical fields, perhaps more so in others than the lighting field, but whom we shall be glad to hear from tonight. I refer to Mr. Sprague.

Mr. Frank J. Sprague: I have not much to say, but I am glad to add a few words of Thomas A. Edison, a man whose name is emblazoned in the records of fame above that of all other great inventors. Twenty-nine years is perhaps a long span in any man's life, but it is a little more than that when, somewhat ambitious as an inventor, I wrote from the Naval Academy to Mr. Edison on some matters relating to telephony. I received a courteous letter from him saying he would be glad to see me at his laboratory on my way home. I remember my first interview with him. It was marked with the same cordiality, but good horse sense, which every man who has come in contact with Mr. Edison has always found. He pointed out the defects in my plan, but seeing my hesitation said: - If you do not think so, go to my laboratory and try it. Going inside the walls of the laboratory, I was attracted by the atmosphere of the place, and soon put aside my particular scheme. Shortly afterwards I left for a trip around the world, but the electric germ had gotten into my head, and I could not get rid of it. The low marks which I later received from my superior officers may be charged to my interest in

electrical subjects.

In the spring of 1880, I was ordered to the Minnesota. a training ship with 350 boys on board, but I had no relish for "training the young idea how to shoot." While roaming around the ship I discovered a single cylinder fly wheel feed pump. I wrote to Mr. Edison in effect -- "Can I borrow" one of the Z dynamos? I would like to make an attempt to introduce electric light into the U. S. Naval Service. I have a feed pump with a fly wheel which I will use as an engine, and I think I can make the dynamo run." Edison's horse sense was manifested by his reply, declining to allow the use of the machine, and explaining that the resultant irregularity will dawn the light, and a year or two later it was my pleasure to secure orders for the Sydenham Electric Exhibition. I landed in London with \$20 in my pocket and many debts on my shoulders, but pending pay arrangements, managed to money get, enough to pay my board. I reported to the august body known as the Jury of that exhibition, containing men like Horace Darwin, Fleming Jenkin, Prof. Chas. Adam and Capt. de Abney, all wise looking and able, and I was young. I announced that the only section of the Jury on which I would act was that dealing with electric lighting, and electric motors if there were such. They looked me over, sized me up and concluded to put the work on me. I was made Secretary of the Section, and with Prof. Adams and Horace Darwin organized

a series of tests for every lamp and dynamo in that exhibition. It was at that exhibition that the first large installation Mr. Andrews spoke of tonight was made, and I became so imbued with the importance of Edison's work, and the future of electrical development that I embraced the opportunity of becoming well acquainted with Mr. E. H. Johnson, Mr. Edison's representative at that time, and on his recommendation I made up my mind to resign from the Naval service. I resigned sooner than Johnson expected, and he had me on his hands. Meanwhile, he had called upon me to make a report of the three-wire system, known in England as the Hopkinson system, both Dr. John Hopkinson and Mr. Edison being independent inventors at practically the same time. I reported on that, left London, and landed in New York on the day of the opening of the Brooklyn Bridge, in 1883, and with a year's leave of absence.

I reported at the office of Mr. Edison on Fifth Avenue, and told Mr. Edison I had seen Johnson. He looked me over and said-"What did he promise you?" "\$2500 a year" I replied. He did not say much, but looked it. About that time Mr. Andrews and I came together. On the 2d of July of that year we were ordered to Sunbury, and to be ready to start the station on the 4th. The electrical work had to be done in forty-eight hours. Having traveled around the world, I had cultivated an indifference to any special difficulties of

that kind. Mr. Andrews and I worked in collaboration until the night of the 3d. I think he was, perhaps, more appreciative of the discipline of what at that time was known as the Edison Construction Department, but more familiarly known afterward as the destruction department, than I was; and one of the old Edison men, Mr. Samuel Insull, once Mr. Edison's secretary, was manager of the organization. Mr. Andrews thought it would be well for us to wait until the morning of the 4th before we started up. I said that we were sent over to get going, and insisted on starting up on the night of the 3d. We had an Armington & Sims engine with sight-feed oiler. 1 I had never seen one, and did not know how it worked, with the result that we soon burned up the babbit in the bearings, and spent a good portion of the night getting them put in order. The next day, Mr. Edison, Mr. Insull and the Chief Engineer of the Construction Department appeared on the scene, and wanted to know what had happened. They found an engine somewhat loose in the bearings, and there followed some remarks which would not appear well in print. Andrews skipped from under, he obeyed orders, and I did not. But the plant ran, and it was the first three-wire station started in this country.

Mr. Andrews spoke of the jumbo plant on the Holborn Viaduct, installed under direction of Mr. Hammer. That was

perhaps the first place where a large electric motor, driven from a machine of like character, was operated by accident. The two machines were running one night, and after the usual falling off in the demand for current, an order was given to the engineer to shut down one engine. He did not think it wise to pull a switch with the current on, so he began to screw down the valve, but the engine kept on running. After a while he had the throttle entirely closed, but the engine was still going. Then we suddenly discovered the fact that the machine was taking current from the other machine, and was running as a motor - driving the engine.

The Brockton station was the first three-wire underground station. I was sent there in charge. In the meantime, I had not been in as great favor with the Construction Department as might have been desirable. A few months had passed, I had drawn my salary, but I was wondering if I would last out. My relations with the Manager were not entirely harmonious. At that time the activities of the Construction Department were somewhat limited by the methods of finding out how to plan a station. Brother Clark remembers how that was done. There was a table on which were laid out mains and feeders, and resistances representing groups of lamps according to the report made by the canvassers. If I remember rightly, the lay-out was founded on the idea of mains of the same size and feeders of the same resistance. This

method took a week or more and Mr. Edison concluded there should be some more abbreviated system. He had be mathematical training, but, as I have said, plenty of common sense. He said -"I want a shorter plan devised". Johnson saw me and said - "Why don't you try it? You had your training at Annapolis and can certainly do it" I said - "All right, I will try it." I went to work and developed a mathematical system which Edison would not accept till proved out. His methods were often very practical. A story is told that two of his assistants were once instructed to calculate the cubical contents of a lamp and that they did so with very much mathematics. The results disagreed, and he said: "Both cannot be right, try it again." They tried it the second time and agreed more closely. He promptly checked them by filling a lamp bulb with water and weighing. I duly presented my plan to him, and he said he thought he would see how it agreed with a careful physical lay-out. My solution finally proved to be between the two, and was adopted as the successful method. I was sent to Brockton with a new feather in my hat, to take charge of the station electrical work, except that pertaining to meters, which was given to another man, and for some time used to make all distribution plans in a few hours.

Well, those were somewhat anxious days, but the Edison business kept growing, and about 1864, at the end of one year's service, Mr. Edison one day asked me to take up the subject of the transmission of power. I wrote him a very glowing epistle, putting into it my best efforts, and told him I must decline to take up the field of power skeept in my own way; in fact, I was

ambitious to make a name in that field, if I could. A reply soon came, a brief typewritten communication something like this: "Sprague: Inasmuch as the Construction Department is about to be given up, I think the best plan for you will be to resign. Edison." That was sufficiently curt and short, but I am very glad I got it, because immediately afterward I took up the subject of the development of the transmission of power and railway work, with what results it would be out of place tonight to detail.

President Sharp: It gives me great pleasure to call on Prof. Marks, especially as the Professor is next on my list.

Prof. Marks: I did not come here expecting to say a word. When I learned that the pioneer, Mr. Andrews, whom I have always esteemed, was going to tell me about the things that happened in the long, long ago, I wanted to come and hear him. I really cannot say very much to add to the interest of the subject myself. I began, you might say, under the personal instruction of Edison, In 1887, to build the first 10,000 h.p. station that was ever attempted. A vast amount of discussion resulted from the fact that we proposed to put in a 1,000 ampere dynamo and run it at 125 volts. We got it in finally, and it always run right. The station itself, as you perhaps know, was the first one run to the then enormous height of 120 feet, and it was to have some 10,000 h.p. of engines, and some 14,000 h.p. in boilers. At that time it was considered wonderful, nothing like it ever heard of before. I kept always turning, however, during disputes, to the common sense of Edison, who was willing to discuss any trouble that came up. We had a good many financial difficulties too. I am not going to tell you more about the engineering -- we have had that fully discussed, but we had a good many financial troubles concerning which it was not proper then to speak. There was a banker in Philadelphia who took the matter up and who undertook to raise a million dollars, but he failed before the money was raised, and it turned out after that, that the Edison royalty was thirty-five per cent of that million -- think of it, gentlemen, \$350,000, and finally they

compromised on \$300,000 in stock and \$35,000 in cash. ward we found we would have to have some \$60,000 more. I did not know why, and it was only later that I found out that the Philadelphia politicians had to be taken care of before we could start the station. It resulted that \$400,000 had to be spent at the start and \$600,000 was left in my hands as engineer with which to build a 10,000 h.p. station, with all the necessary distribution and net-work of conductors. We struggled along with that \$600,000 for two years, and finally we got to going. Then followed two years of service as engineer, during which at times I did not know whether or no I was going to have money enough to pay for the men at the end of the month. We always went behind, and finally I turned to Mr. Edison again and told him something must be done. We had four presidents, and no end of change in the Board of Directors, and trouble and death in the station with it all. One thing we always stuck to and that was that the lamps should be 1-1/2 or possibly 1-1/4 cent per lamp hour, but the people would not have it. Edison again came to my rescue. And we put the lamp hour at 3/4 cent, which was the first time in the history of electricity that the prife of electricity was put at 15 cents per kilowatt hour as the highest rate. I devoted myself to finding out just what it did cost to run the station. I was digging day after day and hour after hour into every bit of data, and it dawned on me final ly, in the year 1890 or 1891 that if you can get anything hooked on that will run from ten to five hours you can sell electricity for five cents to 7.5 cents per kilowatt hour, and if you can get it to run a little longer, at less than 5 cents

per kilowatt hour, and then that system was inaugurated. By that time, (end of 1891) this Edison Company had accumulated a floating indebtedness of \$180,000 and debenture indebtedness of \$300,000, but from that moment on, (and I owe it to the assistance of Thomas A. Edison, because all my own arguments would have had very little effect) but from the moment we inaugurated a scale of 15 cents per kilowatt hour and discounts according to the length of use down as low as 5 cents per kilowatt hour, the prosperity of the station began to be apparent, and in four years we succeeded in paying off our debts and an average dividend of 13 per cent per annum. In this fact you have only amother illustration of Edison's horse sense and far seeing wisdom.

Mr. J. D. Flack: I do not know that I can exactly be called one of the pioneers. My connection with Mr. Edison dates from the year 1887 at the Edison Lamp Works at Harrison New Jersey. Those were the days of the old wooden box voltmeter and indicator such as at that time were used in the earlier stations. It was my duty to look after the calibration of these instruments together with the photometric testing of incandescent lamps. The Edison System at this time was well developed so that I can not recall any of the earlier troubles and difficulties.

I do recall an exhibition of Mr. Edison's horse sense, as it is malled. Mr. Edison's laboratory, at the time I aspeak of was located at the Lamp Works and it was his custom to

have his experimental lamps sent to the photometer department for test. These lamps after test were returned to him together with tabulated sheets showing candle power, economies, etc. When error occurred in these tabulations, as they sometimes did. Mr. Edison would upon an inspection of the sheets immediately point these errors without any apparent calculation whatsoever, running over the tabulations rapidly with his finger checking off the results in error as fast as he came to them, saying as he struck each out "you have made a mistake, try this one over". I know of no case where we made our test a second time that we did not find that we were wrong and Mr. Edison was right. The errors were detected as quickly as he saw the figures and could place his finger upon them. The quickness with which this was done did not permit of even the ordinary mental calculation and the fact that he was never wrong exhibits the remarkable action of his brain. This is especially interesting when it was. is known what a limited knowledge Mr. Edison had at this time of arithmetic.

President Sharp: I wish next to call on a member who is also Secretary of the American Institute of Electrical Engineers, Mr. Ralph W. Pope.

Mr. Ralph W. Pope: Mr. Chairman and Gentlemen: I suppose I might be considered today a pioneer possibly in the electric field, it is just going on fifty years since I took up telegraphy in the winter of 1856. It was not my fortune to be connected with the development of electric lighting, and

what I know about it is what I have seen from the outside, but of course I have watched its development from the very earliest times. I had the good fortune to be associated with Mr. Edison to a considerable extent at the time he was developing the printing telegraph. You may remember that one of his first and most important patents was what was known as the Pope & Edison printer, my brother, the late Franklin L. Pope, being associated with Mr. Edison in that work.

The first electric lighting that I knew of was shown experimentally by the late Dr. Ogden Doremus in the early 70's. It was simply an arc lamp operated by quite a large number of gallon cells of carbon battery. The object he had in view in making the demonstration was to bring about the use of an arc lamp for light house purposes. Then followed the inventions of Mr. Edison developed at Menlo Park. About the same time Mr. Brush came into the field with an arc lamp which made quite a display and electric lighting interests profited very largely by the advertising of the incendescent lamp through the stories of the incandescent lamp in the New York newspapers. This, of course, was about 1878,1879 or 1880. This development of electric lighting was a most happy circumstance for steamship work, and we have heard tonight of the early installation on the Steamship Columbia, which proved the suitability of the electric light for marine purposes, so that today I do not suppose any other light is ever considered where steam is used on board of a ship.

I think it should be stated that the old Pearl Street station in New Work City was on Pearl Street, No. 257, I think a few doors from Fulton Street.

President Sharp: Are there any other gentlemen present who desire to take part in this discussion?

President Sharp: We would be very pleased to hear from Mr. Jenks on the question which is before the meeting.

Mr. W. J. Jenks: Mr. President and gentlemen: The lecture of Mr. Andrews, and the reminiscences which it has called out, carry me back nearly twenty-five years, to the time when, about the 1st of August, 1883, Mr. Sprague came to Brockton to put in the electrical work of that first three-wire underground station, of which I was to be Manager. Mr. Sprague's work at that time had been generally outlined. Three "H" dynamos had been provided, as Mr. Andrews showed you in the photograph of the interior of the Brockton station. One of them ran from a 35 h.p. Armington & Sims engine, 350 revolutions per minute; the other two were operated by a 125 h.p. engine, 185 revolutions per minute. The scheme was that when the load dropped off to small proportions after 10 O'clock, we should, by proper switches, cut one of the outside mixem bus wires (this was before the days of bars) of the three-wire system and instantly join it to the other, so as to have two outgoing and one returning wire, thms relieving one dynamo om the large engine, throwing the load upon the other at single voltage, then switching to the single generator and small engine. We did it until we

found that during thek light load we reversed half of our meters and the station owed several customers for current; then we stopped. We were using the Edison Chemical meter then, and the way you connected it with the circuit made the radical difference between an income and an expense account.

I have a very vivid recollection of one night, not long after the big conductors from the dynamos to the switchboard were very carefully taped , asphalted and put under the floor by Mr. Sprague. There was no cellar, and these dynamo wires were run straight down beside the base frames, laid in grooves cut in the floor timbers and came up on the side of the room. We had started the station Oct.1, 1883 with great pomp and amid popular acclaim. After having staid with us a week Mr. Edison had gone home and we had a locomotive engineer who was not supposed to be afraid of anything, to run the engine and dynamos. All of a sudden one quiet evening there came a grand flash and noise and some fire through the floor; the fireman hid behind the hoiler, the engineer jumped out of the window, and Mr. Sprague turned the juice off and stopped the For a time these things happened right along. engine.

The Brockton station was the birthplace of the Sprague motor. Although it was for some years a show-plant, illustrative of the best practice in the use of the three-wire system, the time it afforded Mr. Sprague for embodying his ideas in his first crude motors, resulted in a degree of progress which entitles this pioneer station to the greater distinction of being

the starting point from which have spread the ever-widening uses of the Sprague methods and apparatus. The little office of the station had a tapestry carpet and a lounge. For some weeks during Mr. Sprague's watchcare of the system's operation. the carpet was littered with armature cores, magnet wire of varied coverings and colors, jack knives, asphaltum varnish, japan and shellac bottles, paper insulation, magneto testing bells, and other interesting and important materials and devices. Most of these were stored under the lounge during the hours of extreme mental activity following the receipt from New York of blue-prints of new cities and towns to which Mr. Sprague has alluded, charted to show existing lighting, and waiting to learn, by Mr. Sprague's mathematical methods, the size and cost of electric conductors for so-called "village-plant" threewire installations. It was generally understood by the station employees that the most satisfactory results were secured when these charts and Mr. Sprague were spread at length on the office carpet, and the overflow accessories of wires, bells and asphaltum were kicked into the corner. Thus the three-wire system prospered while its engineering department was located in Brockton.

Ef our friend Mr. H. Ward Leonard were here he could tell interesting stories of his work at Brockton as Mr. Edison's meter expert. The first locally employed meter man was a boy named Kimball, who was disposed to spend more of his time in revelling in new electrical problems than in weighing the plates of chemical meters. I happened to find mux to-day an autograph

letter written by Mr. Edison to Mr. Andrews Jan. 2, 1884, three months after the Brockton station started, and containing suggestions for later stations. I will read a few sentences:

I think the wages for men at stations should be as follows: Engineer, \$65 per month daylight to daylight running, starting, of course, one-half hour before required in evening. They do their own firing up to 1600 lights, after that a fireman allowed. The meter man should be called manager, salary \$50 a month. Duties taking meters, collecting, keeping books and running electrical part from one-half hour before dusk until 75 pct. of load goes off. I should not take too young a man for this, say man from 23 to 30 years old, bright and businesslike. Don't want any one who yearns to enter a laboratory and experiments. We have a bad case of that at Brockton; he neglects business to potter. What we want is a good lamp average and no unprofitable customers. You should have these men on probation and subject to passing an examination by me. This will wake them up. Also I think it very essential that for several days the steam should be raised in the morning and if there is a spare at station they should be practiced. (both Eng. and Manager) on switching, using bank of lamps. We have found that the Brockton men were not sufficiently practical, hence if anything goes wrong they lose their heads."

There are many things that come to the minds of oldtimers here which would be of great interest to all of you. Reminiscences like these may be made valuable as well as entertaining, and someone should undertake the task of gethering them

while the promoters and early managers remain to tell their stories. Of the Brockton plant constructors, John Kreusi, who placed the underground conductor system, has gone, but the rest are available. Mr. Andrews deserves our cordial thanks for his effort to revive these recollections, and another evening might well be devoted to a further address along similar lines.

# WILLIAM H. MEADOWCROFT PAPERS

REMINISCENCES BY WILLIAM G. BEE

Anecdote showing Edison's tenacious memory, related by Billie Bee.

"One day Col. Bailey, of Amesbury, Mass., who was visit ing the Auto Show in New York, came out to the Laboratory to see Mr. Edison, who had expressed a desire to talk with him on his next visit to the metropolis. When he arrived at the laboratory, Mr. Edison was asleep on the cot in the library. I had entertained Col. Bailey for about three quarters of an hour, when he said he had only a very short time to stay as he desired to take a certain train for home. As a rule, we never awake Mr. Edison from sleep. but as he wanted to see Col. Bailey, I felt it was up to me to do so this time, and I went and tapped him on the shoulder. He awoke at once, smiling, and jumped up and, as usual, was instantly himself and advanced and greeted the visitor. His first question, after the greeings were over. was 'Well, Colonel, how did you come out on that experiment', referring to some suggestions he had made at their last meeting a year before. For a minute Colonel Bailey did not recall what was referred to, but a few words from Mr. Edison brought it back to his remembrance, and he reported that the results had justified Mr. Edison's suggestions."

Fillie Bee says that when they were working at Silver Lake, day and night, and were all tired out, he has seen Mr. Edison get into a roll-top desk, ourl up like a kitten and go to sleep instantly. And he always wakes up good natured and smiling, and always the live-wide-awake Edison, instantly in full possession of his senses.

April 15/09.

**WILLIAM H. MEADOWCROFT PAPERS** 

REMINISCENCES BY CHARLES T. HUGHES

Legal Box 60

STATEMENT OF CHARGES T. HUGHES MADE JUNE 19, 1907.

I went to work with Mr. Edison at Eenlo Park. on October 21, 1879. IB was then a very handsome man, 33 years of age with very dark brown hair, much lighter in weight than at present, probably about 170 lbs. a man of great force and of the same dominating personality as at present. His practice was to receive the heads of his departments almost every day and lay out their work for them. He was a very hard worker; he did not have any regular hours; I have known him to spend forty-eight hours at a time at the Laboratory without going to the house, which was only about 1000 feet away, and without taking off his clothes. His principal place to rest was underthe stairs in the laboratory on some old paper which had been thrown in there merely as rubbish, but he would go in there to sleep. He sometimes slept an hour or two; it depended on what he was working on. The main worked day and night when they had to. His wife lived at Menlo Park. There were from 60 to 70 men employed. We had a machine shop, a single story building, about 120 by 50, and the laboratory was a two-story building about 150 by 50, and there were small buildings around, one little place being used as a lamp factory and containing about six mercury pumps. At that time, the principal work was on the incandescent lamp. Charles Batchelor was Edison's first assistant and the principal man next to him. John Kraisi was the foreman in the Machine Shop. Charles Dean was the principal mechanic and machinist, and Francis R. Upton was the

mathamatician. Considerable work was being done on the motograph telephone. Little or nothing was being done on the phonograph or telegraph, but a little work was being done on the autographic telegraph. Each experimenter as distinguished from the machinist had dharge of his own particular department. The day I arrived the first pair of incandescent lamps with paper filaments were being exhausted by the mercury pump. Edison had not then begun to use bamboo, but bamboo was settled upon after I went to the laboratory. Edison sent a man named Moore to look for fibres of different kinds, and Moore would send them back to him and he would try them, and finally, after trying a great many different kinds, it was decided that bamboo was the best. I do not remember Edison sending Professor James Ricilton of Maplewood, N.J. on this work. After the two lamps which I first saw, were made, Edison began to make paper lamps in not very large quantities, and it was one of my duties to look up the different kinds of paper. I obtained samples of the commercial paper of different kinds, expecially white papers. I finally arranged to have the Crane Paper Company make up a special paper for him. The first lighting plant at Menlo Park emply ed four dynamos in multiple, which were constructed at the Laboratory. Great difficulty was experienced in regulating them at first. As soon as Edison found that he had perfected the lamp commercially, he bagan to prepare for practical demonstration by installing a number of small dynamos and running circuits through the village of Menlo Park, and as his idea was to install the first incandescent station in New York City and he knew that the system would have to be placed underground, he put his system of conductors undergraund at Menlo Park. Of course it was a very

orude affair as compared with the system later adopted in New York, but it answered the purpose very well. I should say this was early in 1880, but perhaps was as late as the summer am of that year. Sometime after that J.P. Morgan sent a number of Swedish naval officers out to see Edison's system. He had as a result of a number of weeks' work, a dozen or so of incandescent paper lamps and put them in an old show case, letting them rest on cotton so as not to be injured and when these lamps were connected in circuit they went out immediately, evidently because of the loss of vacuum. Edison asked me if I had any more of them and I told him that I had, and took the remaining lamps and put some resistance in the circuit so as not to give them the full voltage and gradually cut off the resistance, so that the lamps were brought up to a bright red, and when I notic ed the blue flame in the bulb where the carbons join the leading in wires, Edison admitted that it would be a good thing to get those fellows out of the place. It was not so much a question of the hours of burning, as of preserving the vacuum for a long time. Scientific men had all been telling Edison that it was an utter impossibility to retain a vacuum in glass, and I thought that they knew what they were talking about and that Edison did not. Edison tried a lot of different kinds of glass until he finally found what the constitution of the glass should be to offer the greatest resistance to the entrance of air. Edison did not seem to be all discouraged at this failure. I told him when he came back that it was too bad and that it was mighty discouraging, but he said it was nothing and that he knew just what was the matter. As I recall it, he told me that the place that the air came in was at the joint where the lamp was sealed off at the top, and I think that

the way he got around it was to put an extra seal or seal an extra piece of glass over the top that was likely to crack. This was done right away. There was no trouble with the exhaution of the lamps, but the trouble developed only when the lamps were kept for a long time out of use. in 1879 the paper lamp had been perfected, and he was satisfied that it was a commercial article. My work at first was with the motograph. The chalks were very irregular and we had a lot of trouble and Edison always use to say that anything, no matter how useful it might be, would never be successful commercially, unless it was of such a character that a fool could operate it. One of the difficulties with this was keeping the chalk spool damp, and as the percentage of moisture changed, the efficiency of the telephone varied with it, so as to give a great deal of trouble. When the spool was kept very wet, it did not work well, but if kept sust right it worked first-class. I made hundreds of experiments and tried all kinds of materials and all kinds of solutions. Another difficulty was the chalk spool had to revolve while you were receiving a message and if it did not there was nothing but a jumble of noises. The first thing we did was to have a little arrangement of putting your finger in for revolving the chalk speel and then we had clock work to revolve it, but then we found in actual practice that people would not only forget to wind the clock, but would actuall fail to push the button to revolve the motor, and the result was that the telephone was not effective at all. I experimented on this work about a year and stopped because it was pretty well determined by Edison that it would never be a success. It was a very loud talking instrument, louder than the present phonograph, and although no horn was used, there was no trouble at all in hearing 100 feet away from the receiver.

During this time experiments on the electric lamp were still going on. Commercial arrangements were made to take up the lamp about 1880. Capitalists from New York, including J. P. Morgan and his fraends went down to Menlo Park to see the exhibit and agreed to put it in. I knew of the installation of the first plant at Pearl Street, but had nothing to do with it. The apparatus for that plant was built at Goerok Street.

In the latter part of the year 1880, I took up the development of the electric railway. Before I went with Edison I had been a railroad man and when I first heard of the scheme I became very much interested and enthusiastic about it. One of my own books relating to this work is attached hereto. Tow roads were built, the first road was about 2 mile long and ran from the shop at Menlo Park down the hill and around a curve forming the letter U. It was a single track road with rather light rails - - second-hand street car rails. The current was supplied through the rails so that all of them had to be insulated from the tires. We used for this purpose tar, asphalt, canvass paper and things of that sort. I should say the first road was built in the summer of 1880 and was operated early in the year 1881. The motor was capable of developing from 20 to 25 H.P. and the current was supplied from the lighting plant. On this road we were able to get as high as forty miles an hour. The first road was not considered a good demonstration and we decided to build another one about three miles long. It ran from the point where the original road ended (the latter being torn up) and extended through the town in almost a direct line to a place called - dark Lane. At the beginning of the road we built a small house for the lonomotive. The road was

the standard 4' 81" gauge. The locomotive shown in the victure is the second locomotive, used with the second road and which was built in 1881 or 1882. For the first road, the locomotive was an ordinary flat dump car about 6 ft. long and 6 ft. wide, with an dyamo at one side and bolted to the axle. For the second road we at one or two trailers and a passenger car, and also a freight car. We carried a lot of passengers on the second road, and sometimes ran all day long. Edison took a very great interest in this work and frequently road back and forth over the line and sometimes operated the locomotive himself. One day Henry Villard sent down a man named Henderson, who was the chief engineer of the Northern Pacific Railroad Company to look into the electric railroad project, Edison and Henderson and I started out on the locomotive and Edison ran it. Just beyond the engine shed there was a trestle 60 or 70 feet deep with a considerable down grade and Edison put on all the power's when we were going over this trestle, so that we must have been running at least 40 miles an hour. The engine weighed six tons and we were running on sendhand street car rails weighing only 16 lbs, to the foot. and when we got where the trestle and started down the track I saw the perspiration coming out over Henderson's face. As soon as we slowed up a little, Henderson said -"when we go back I will walk if there is going to be any more of that kind of running I won't be in it". Villard was interested in the railroad scheme, because it is one of Edison's pet ideas to operate electric railroads in the wheat regions of the company as feeders for the great transcentinental line. We operated the read for a couple of years and then tore up the tracks, since Mr. Morgan said that he did see anything in it and refused to put up

any more money. Edison spent all the monoy he had afterwards to demonstrate its meastaility, and I remember that when we were still experimenting, Hr. Insull cars to me and asked me to try and get Edison to give it up, because he could not get any more money. Insull at that time was Edison's private secretary. When the road was torn up, practically the whole force had been moved to New York to construct the first Edison lighting plant, and of course the interest in Monlo Park gradually dwindled until it was closed down entirely. I do not think Edison intended to frighten Henderson on the trip I spoke of, but he simply wanted to see what the locometive would do. However, I noticed that Edison seemed rather pleased when he found that Henderson was so scared.

I am not go to New York with Edison, but left him when the electric railroad enterprise was given up. I had to look for a job somewhere and took an agency for the Edison Blectric Light Company and tried to organize local companies and sell apparatus. I did organize the first underground system outside of New York city in the town of Newburgh. I told Edison I could get \$60,000. for a 1600 10 c.p. lamp plant, which was nearer a miracle than anything he had everedone. I saw more or less of Edison during the time these difficulties with the ore milling scheme and in fact, bought a good deal of stock in the ore milling Company and in the Concentrating Works. He me ver talked with me about his troubles. He is and always has been the most cheerful man under discouragements and difficulties that I ever saw. In fact, he did not seem to know when he was up against a stone wall, and if it were not for that particular qualification he would not be where he is today. When those Swedish naval officers came far

with Mr. Morgan and we showed them the incandescent lamp, and the lamps gave out, I thought that my place would be out in the fields with the hoe and I would not have given it conts for the entire incandescent lamp system. But it did not seem to bother him in the least. Risen has teld me many times that he nover became interested in anything antil difficulties were encountered. He has always told me that he rever care to do what anybody could do. For a man whome is so completely wrapped up in his work, he is wonderfully generous and wonderfully unselfish - - too much so in fact, since people try to impose upon him. He seemed to rarely become angered and was more likely to thing.

Regarding the autographic telephone, guite an extensive experiment was being carried on with it when I entered the laboratory. I did some work in this line with Mr. Patrick Kenney, who had charge of the experiment. He also built a model of the magnetic iron ore concentrating apparatus, but he had nothing in the way of crushing or grinding devices. His idea had been simply to treat black sand containing iron in considerable quantities, which is found in certain parts of the country and which would not require orushing. I recall the first Mrs. Edison very well. She was a very nice woman, braught bright and vivacious, beautiful in appearance and character, and was very much devoted to him. There were three children at the time, Tom, Will and Marion. This was about the year 1883 and 1884 - Tom and Marion were called Dot and Dash, but Willie had no nick-name. Dot grew to be a very nice girl - she was about ten years old at this

time.

been superintendent of a Telephone Company in Albany and a friend of mine who was one of the principal owners of that concern heard that Edison wanted somebody to exploit his motograph telephone in Chili, and I thought that this might be an opportunity for me, so he gave me a letter of introduction to Edison. His name was H.H. Eldridge. When I came with Edison I have been for a number of years a railroad conductor, and hadpicked up quite a number of stories during my experiences, but I found that Edison was dust as full of stories and we use to frequently exchange experiences with one another. He had a better memory than any man I had ever seen and if he heard anything he never forgot it. No matter how busy he was he never seemed at loss for an appropriate aneodote. At that time Edison smoked a good deal and very seldom drank anything. He was not a testoatler, but chewed tobacco. He seemed to spend very little time at his meals, ate very bit tle and very rapidly. About two or three years ago I came in the laboratory and it seemed to be one of the days that he did not have very much work to do, and after we had talked for an hour or more, he suddenly said: "By George, I have forgotten my lunch" . The lunch had evidently been waiting for him for a long time, because the sandwiches were so dried up that they curled over at the edges. At Menlo Park, he had his lunch at the laboratory; sometimes he would eat with Batchelor or some of the other heads of the departments, and lunch would be sent down from the house. There was a time during the incandescent lamp experiments that they served supper at midnight and he ate with the other men who happened to be daing night work. Edison worked sometimes all night, and -9-

I way I happened to meet Edison was that I had

asleep on the pile of newspapers. Almost always during the experimenting on the incandescent lamp, Edison worked until two or three o'clock in the morning. There were two or three boarding houses near the laboratory at Taux Menlo Park, but most of the men lived at Newark Rahway, and Elizabeth. Batchelor was also a very hard working man and contributed much to the success of the incandescent lamp. I think he was an watchmaker originally, and a very fine mechanic with plenty of horse sense, and seemed never to tire or weaken. I recall that at one time Edison got some Italian hemp, which was very fine, a great deal finer than human hair, and filaments thereof were carbonized and put into the platinum clamp ready to be inserted in the lamp. Batchelor was carrying two or three of these hemp filaments in abox from the laboratory across the yard to the room where the lamps should be exhausted, and although he had worked two or three hours to get them ready, owing to their fineness and delicacy, when he got to the room he found that they were lost, apparently having blown away. Without saying a word, he started back and made up gome more. It was this faculty that made him so helpful to Edison. But what I have seen of Edison it has always seemed to me that the secret of his success was based upon his good health, his physical strength combined with the faculty of enormous energy and does not know what monotonty means. He gave me the idea once of his own impression of his success. The first Mrs. Edison asked me one morning when I man was going into the City to get them a box at the Charity Ball, and Mrs. Dr. Gurnsey being President of the affair, I saw hor and told her what I wanted. I said that Mr. Edison had come in on the same -10-

frequently we would lose him and find him under the stairs

train with me that morning and I did not thing he was going home again and he had a brown check suit of clothes on but I could not tell whether he had a neck tie or not. Just as we got to that point, Dr. Gurnsey came in and his wife, said to him "Dr. will we let Mr. Misson come to our ball with a brown check suit of clothes on tonight?". Dr. Gursney, with a good deal of said: "That man's god-like genius will take him anywhere". I was telling Edison later what Dr. Gursney said, and with a good deal of disgust, said: "God-like nothing", "sticking to it is the genius". And he certainly knows how to do that.

Regarding the storage battery, I have had an Edison battery in my car for about four years and have used it for three years every day, at least three hours, running rain or shine. About four or five months ago, I noticed the voltage did not seem to keep up and I took it to the factory to have it looked over and it was found that about three of the cells were a little out in some way, and these were fixed up. We that exception, the battery is exactly as good today as when I put it in. I have not given the battery any attention myself and have depended entirely upon a comparatively ignorant colored man, who has had entire charge of it. I have had absolutely no trouble whatever with the battery. For about eight months I was under the impression that the battery had to be filled with distilled water every three weeks until I later learned that this ought to be done once a week, but even this neglect seemed to make no impression on the results. With my machine I can make about 12 miles an hour, and I have frequently been out four hours and running all the time. Without doubt, I can make fifty miles easily on a level today.

# WILLIAM H. MEADOWCROFT PAPERS

REMINISCENCES BY SAMUEL INSULL

EDISON BUILDING, 109 ADAMS ST. CHICAGO, ILL. CABLE ADDRESS: THOULL, CHICAGO,

Chicago, Feb. 10, 1909.

T. C. Martin, Esq., Care Electrical World.

239 West 39th St., New York City.

Dear Mr. Martin:

I have your favor of the 8th. I send you enclosed herewith shorthand writers notes of what I dictated in answer to your questions. I have not had an opportunity to read this statement, so I send it to you subject to correction later on. The only subject. which I have not dealt with is the question of the consolidation of the Thomson-Houston and the Edison General Electric Companies. I do not know whether or not I want to dictate a memorandum on this subject. There are many reasons why I should like to put my narrative of the negotatitions on paper; on the other hand there are many reasons why I should not, as in dealing with the facts, I might hurt the feelings of some people still active in the electric manufacturing business. As to whether I shall dictate anything on this subject, I will decide after having seen you next week.

I am rather expecting to stay at Delmonico's, Fifth Avenue and 44th Street this trip, and in all probability I shall reach New York on Tuesday. If I get an opportunity, I shall telephone you and try and make an engagement with you.

In sending you the enclosed memorandum, I want it understood

EDISON BUILDING, 139 ADAMS ST. CHICAGO, ILL. ABLE ADDRESS: "INBULL, CHICAGO

(T C M)

(2)

that this memorandum is my property, but you are welcome to make use of anything in it in connection with the biography of Edison which you are now engaged on. The reason I mention this is, that it is the first time I ever dictated anything with reference to my relations with Edison's business, and it may be that some time or another I may want to use the enclosed in connection with something that I might want to publish myself.

Yours truly

Launel Lubuel

#### *IENCLOSURE1*

# M. Insull's notes - Feb, 1909

net him?

Do you recall any details of Edison when you first

2. Do you recall anything about the impression he made on you?

 A personal sketch of him at that time, brief, would be interesting - I mean how he looked and spoke, his method of work.

I can best answer the three above questions as one. I first met Edison on March 1st, 1881. I arrived in New York on the S.S. "City of Chester". I landed, I should judge, about five or six o'clock in the evening. I went direct to 65 Fifth Avenue. I had come over to act as Edison's private secretary, the position having been obtained through the good offices of Mr. Edward H. Johnson, whom I had known in London, and who wrote to Mr. U.H. Painter of Washington, about me in the fall of 1880. Mr. Painter sent the letter on to Mr. Batchelor, who turned it over to Edison. Johnson returned to America late in the fall of 1880 and on the 16th or 17th of January 1881, cabled me to come to this country. I left Liverpool on the S.S. "City of Chester" on the 17th of February, 1881, and arrived in New York late in the afternoon of the first of March. At the time Johnson cabled for me Edison was still at Menlo Park but when I arrived in New York the offices of the Edison Electric Light Company had been opened at 65 Fifth Avenue and Edison had

#### **IENCLOSURE**1

moved into New York with the idea of assisting in the exploitation of the Edison Electric Light Company business. I was taken by Johnson direct from the Imman steamship pier to 65 Fifth Avenue and met Edison for the first time. There were three rooms on the ground floor of 65 Fifth Avenue at that time . The front room was used as a kind of reception room, the room immediately behind it was used as the office of the president of the Edison Electric Light Company and Major E.B. Baton was the president. The back room, which was directly back of the front entrance hall, was Edison's office and it was in this room bhat I first saw Edison. There was very little in the room at the time except a couple of walnut roller top desks, which were very generally used in American offices at that time. Edison received me with great cordiality. I think possibly he was a little disappointed at my being so young a men; I had only just turned twenty-one and had a very boyish appearance. The picture of Edison as I first saw him is as vivid to me now, although it is within a few days of twenty-eight years since our first meeting, as if it had occurred yesterday. I had been connected with Edison's affairs in England, as private secretary to his London agent, for about two years, and had been taught by Johnson to look upon Edison as the greatest electrical inventor of the day ( a view of Edison which, by the bye, has been strengthened as the years have rolled by), and men owing to this and the fact that I felt highly flattered at the appointment as his private secretary, I was

naturally prepared to accept him as a hero. With my strict English ideas as to the class of clothes to be worn by a prominent man, there was nothing in Edison's dress to impress me. He wore a rather seedy black diagonal Prince Albert coat and waistcoat, with trousers of a dark material and a white selk handkers chief around his neck, tied in a careless knot falling over the stiff bosom of a white shirt somewhat the worse for wear. A large wideawake, soft hat, of the then generally used in this country sombrero pattern. A rough brown overcoat, cut somewhat similar to his Frince Albert coat, his hair worn quite long and hanging carelessly over his fine forehead. His face was at that time, as it is now, clean shaven. He was full in face and figure, although by no means as stout as he has grown in recent years. What struck me above everything else was the wonderful intelligence and magnetism of his expression and the extreme brightness of his eyes. He was far more modest than in my youthful picture I expected to find a man of such distinction. After a short conversation Johnson hurried me off to meet his family and later on in the evening, probably about eight o'clock, Johnson/and I returned to Edison soffice and I found myselflaunched without further coremony into Edison's business affairs. Johnson had already explained to me that he was sailing the next morning, March 2nd, on the S.S. "Arizona", and that Edison wanted to spend the evening discussing matters in connection with his European affairs. It was assumed, anasmuch as I had just arrived from London, that I would be able to give more or less informa-

tion on this subject. As Johnson was to sail the next morning at five o'clock, Edison explained to me that it would be necessary for him to have an understanding of European matters from him, and he, Edison, started out by drawing from his deak a check book and stating how much money he had in the bank and he wanted to know what European telephone securities were most salable, as he wanted to raise the necessary funds to put the incandescent lamp factory, the Electric Tube Works, and the necessary shops to build dynamos on their feet. The coincidence of my arriving one evening and Johnson leaving the next morning resulted in this, my first evening spent with Edison, being devoted to a discussion of his financial affairs. All through the interview I was tremendously impressed with Edison's wonderful resourcefulness and grasp and his immediate appreciation of any suggestion of consequence bearing on the subject under discussion His appearance was not what you would call "slovenly"; I think it is best expressed by the word "carcless". He spoke with very great enthusiasm of the work he had before him, viz., the development of his electric lighting system, and his one idea seemed to be to raise all the money he possibly could, with the object of pouring it into the manufacturing side of the electric lighting business, and I remember how wonderfully impressed I was with him on this account, as I had just come from a circle of people in London who not only questioned the possibility of the success of Edison's invention, but often expressed doubt as to whother the work he had done could be called an invention

at all. After discussing affairs with Johnson (who was receiving his final instructions from Edison) far into the might and going down to the steamer to see Johnson aboard, I had finished my first night's business with Edison at somewhere between four and five in the morning, feeling thoroughly inbued with the idea that I had mot one of the great master minds of the world. You must, of course, allow for my youthful enthusiasm, but you must also bear in mind Edison's peculiar gift of magnetism, which has enabled him during his career to attach so many men to him. I fell a victim to the spell at the first interview. It is a great pleasure to me to recall my feelings of that night, feelings which are just as strong today as then.

4. Can you sketch the environment, which would help for a picture of early Menlo Park?

The next morning, Tuesday, I went with Edison to a conference with Mr. John Roach, the ship-builder, and at that conference Edison agreed to take the old Astna Iron Works, the works where Mr. John Roach laid the basis of his fortune, but which at that time were not used and which were situated on Goerok Street, west of Grand Street on the East side, and in these works were established the first Edison dynams an unfacturing establishment, known as the Edison Machine Works. That same Tuesday night I paid my first visit to Menlo Park with

Edison. Up to that time I had seen very little of the incandescent lighting. Johnson had a few lamps in London, lighted from primary batteries. In the summer of 1880 Swan had a few series lamps burning in London. When I arrived in New York there was a small gas engine plant just being started at 65 Fifth Avenue. but I had never seen an electric lighting central station system until I had wisited Menlo Park. My recollection is that I arrived at Menlo Park and went to Edison's house for supper. and when walking from the Menlo Park station to the Edison residence, about a block east of the depot, I saw for the first time a number of buildings lighted by incandescent lights. After supper we went up to Edison's library and office. It was situated in a brick building on a little higher ground than his residence. Upstairs was his well equipped technical library, which formed also his office, and from that time on, whenever I was . in Menlo Park, my office. The ground office of the brick building was occupied by the technical staff attached to Edison's laboratory. Back of this laboratory and facing the building, was a two-story wooden building in which were situated his chemical laboratory and experimental rooms and back of this wooden building was another brick building containing the machine shop attached to the first laboratory, and also his boiler plant. There were probably a dozen different buildings, including the houses of Edison, Batchelor, Kruesi and Upton, and a small lamp factory about one-third of a mile away on the south side of the Pennsylvania railroad track. The houses were all lighted with

incandescent lamps. There were a few motors operating and the current was distributed by means of underground conductors imbedded in asphaltum and surrounded by a wooden box. The system employed was naturally the two-wire system, as at that time the three-wire system had not been thought of. The lamps used were partly of the old fibre horse-shoe filament paper carbon lamps and partly bamboo carbon filament lamps and were of an efficency of from 95 to 100 watts. I can never forget the impression that this first view of the electric lighting industry produced upon me. Menlo Park was naturally the Mecca of those who looked upon Edison as the great inventive hero of the time. It must always be lookedupon as the birthplace of the electric light and power industry. At that time it was the only place where could be seen an electric light and power multiple are distibution system, the operation of which seemed then to my youthful mind as a ccessful as the operation of one of the large metropolitan systems of today. I can never forget this, my first visit to Menlo Park. I well remember about ten o'clock that night going down to the Menlo Park depot and getting the station agent, who was also the telegraph operator, to send some cables for me to my London friends, announcing that I had seen Edison's incandescent lighting system in actual operation, that so far as I could tell it was an accomplished fact; and I also well remember that a few weeks afterwards I received a letter from one of my London friends, who was a "doubting Thomas", upbraiding me for

so soon coming under the spell of the "Yankee inventor".

5. Can you outline your duties? That would give some of the routine, such as it was, at that active time.

6. Did Edison dictate answers to correspondence, etc.? Did he marginalize memorandums of documents, etc.? Something about his characteristics of this kind.

I do not think that I had any understanding with Edison when I first went with him as to my duties. I did whatever he told me to do and looked after all kinds of affairs, from buying his clothes to financing his business. I used to open all the correspondence and answer it all, sometimes signing Edison's name with my initial and sometimes signing my own name. If the latter course was pursued and I was addressing a stranger I would sign as Edison's private secretary. I held this power of attorney and signed his checks; it was seldom that Edison signed a letter or check at that time. If he wanted personally to send a commmunication to anybody, if it was one of his close business associates, it would probably be a pencil memorandum signed "Edison". I was a shorthand writer and seldon took down from Edison's dictation, unless it was on some technical subject which I did not understand. I opened all correspondence and would go over it with Edison, so metimes making a marginal note in shorthand and sometimes Edison would make his own notes on letters and I would be expected to clean up the correspondence

with Edison's laconic notes a guide as to the character of answer to make. It was a very common thing for Edison to write the word "yes" or "no" "E" and this would be all I would have on which to base my answer. I was naturally a very early riser and as a result of a training in an English business establishment. I kept regular business hours. The first few months I was with Edison he was most of the time in the office at 65 Fifth Avenue; then there was a great deal of trouble with the life of the lamps there and he disappeared from the office and spent his time largely at Menlo Park and I spent a large portion of my time between 65 Fifth Avonue and the financial district (Wall Street) and Menlo Park. At another time there was a great deal of trouble with some of the details of construction of dynamos and Edison spent a great deal of time on Goerck Street, which hadbeen very rapidly equipped with the idea of turning out bi-polar machines of the vertical type direct-connected machines, the first one of which went to the Paris Exposition and the next six being installed in the old Pearl Street station of the Edison Blectric Illuminating Company of New York, which was situated on Pearl street just south of Fulton street on the west side of the street. Edison devoted a great deal of his time to the engineering work in connection with the laying out of the first incandescent electric lighting system

in New York, in a district bounded by Fulton street on the north, Nassau street on the west. Wall street on the south and Pearl street or one or two blocks further gust on the east. Apparently at that time (this was between the end of 1881 and spring of 1882) the most serious work was the manufacture and installation of underground conductors in this territory. These conductors were manufactured by the Electric Tube Company, which Edison controlled, at a shop at 65 Washington street, which was run by John Kruesi. remember the half round coppers which were used. These were keptin place first of all by a heavy piece of cardboard and later on by a rope and then put in a twenty-foot iron pipe and a combination made of asphaltum and linesed oil was forced into the pipe. I remember as a conincidence that the building at 65 Washington street was only twenty feet wide. These lengths of conductors were twenty feet, six inches long, as the half round coppers extended three inches beyond the drag ends of the twenty foot lengths of pipe, and in ma one of the operations we used to ax have to take the length of tubing out of the window in order to turn it around. I was elected secretary of the Electric Tube Company and was expected to look after its finances, and it was in this position that my long intimacy with John Kruesi first started. In those days John Kruesi's English was a little more broken than it was in the years that followed, and I remember at one of my early interviews

with him he told me at lunch one day that he wished as a favor that I would return all his letters to him, first correcting the English, as his knowledge of business correspondence was limited, and he would like to gave the bem fit of my corrections of any letters which he might address to me,

You ask me whether Edison marginalized documents. He did this very extensively. Edison had a worderful ability in pointing out the weak points of an agreement or a balance sheet, all the while protesting that he was no lawyer or accountant, and his views were expressed in very few words but in a characteristic and emphatic manner.

7. Do you recall much of Edison's affairs -- financial? My own impression at the time was that he spent all that the Punting 1878-9 I had a good deal to do in New York at the Phonograph office, 203 Brondway, and later in Reade street, The bookeeping sound revalities an earling for the royalties an earling for the operatus. The bookeeping sound really to be done in Oharlie Chever's office. I have some of his own statements as to the Newark period.

6. In other words, did you not have to systematize Edison's business life?

companies and inventions? There was the oil Phonograph Company a Carbon Novelty Company and two times others. I used the electric pen frequently in 1878-9 but have invove learned when it dropped out of manufacture. I was useful.

early
In those/days I had little or nothing to do with the phonograph business, it was absolutely dead. Johnson was the only man who seemed to take any interest in the phonograph. He had one of the old types of machine with tin-foil and used to experiment on it a good deal. Edison's only apparent interest in the phonograph at this time could probably be summed up on the remark which he made to me one day: "Well, Sammy, they never will try to steal the phonograph; it is not of any commercial value and therefore nobody will ever have the incentive to try to get it away from me." This remark may seem odd in these days, when one of the large businesses of the country is that of manufacturing talking machines and the records which are used on them. I had nothing whatever to do with Edison's affairs at Newark. You must remember that he moved to Menlo Park about the time he started his electric lighting experiments. I never had anything to do with the Carbon Novelty Company. At the time I came to this country the electric pin was manufactured I think by the Western Electric Company and was used a little in New York, I had seen it used more in London. There was a duplicating business operating in London by Thomas Butler who was my predecessor as private secretary to Col. Gouraud. Edison's representative in London. At a later date Butler gave this up and came to America and acted as my private secretary.

I never attempted to systematize Edison's business life. Edison's whole method of work would unset the system of any business office. He was just as likely to be at work in his laboratory at midnight as midday. He cared not for the hours of the day or the days of the week. If he was exhausted he might more likely be asleep in the middle of the day than in the middle of the night, as most of his best work in the way of inventions was done at night. I used to run his office on as close business methods as my experience admitted, and I would get at him whenever it suited his convenience. Sometimes he would not go over his mail for days at a time, but other times he would go regularly to his office in the morning. At other times my engagements used to be with him to go over his affairs at Menlo Park at night, if I was occupied on business in New York during the day. In fact, as a matter of convenience I used to more often get at him at night than in the day time, as it left my days free for me to transact his affairs and enabled me probably to a midnight luncheon to get a few minutes of his time to look over his correspondence and get his directions as to what I should do in some particular negotiation or matter of finance. This arrangement might result in my visiting him at Menlo Park or at Goerck Street in in Bergmann's shop, or where ever the necessities of the moment compelled him to give attention to experimental work. I think it rather grew to be a habit for him to transact my business with me at night time;

If for any particular reason he was spending his time regularly at the office at 65 Fifth aronue during the day he made a practice, and consequently so did I, of spending the evening there as well. While it was a matter of suiting Edison's convenience as to when I should transact business with him, it also suited my own ideas, asit enabled me after getting through with my business with him to enjoy the privileges of watching him at his work and to learn something about the tochmical side of the business. Whatever knowledge I may have of the electric light and power industry, I feel I owe it to the tuition of Edison. He was about the most willing tutor, and I am afraid I must confess that he had to be a very patient one.

To go back to your eighth question: I never tried to systematize Edison's business life, it would have been impossible, but I tried as far as I could to xxx systematize his business.

10. Can you summarize a few reminiscences of work on the incandescent lamp?

At the time I came to this country, March 1881, the incandescent lamp took from 95 to 100 watts. Edison had Just begun to receive bamboo from Japan. At that time he was hunting for some other material. It was some years later when the flaments were made chemically. In 1881 and 1882

Edison was intent on finding a vegetable fibre. - He wanted something that would make up a higher resistance filament. than the bamboo which he was able to get. He sent M.F. Moore back to Japan to see if he could get a higher grade of bamboo that is. finer fibre- something which when carbonized would have a higher resistance. He sent Frank McGovern to hunt through South America for some kind of vegetable fibre. and Edison ransacked the vegetable, kingdom of the world to get something that would out down the current consumption. I do not remember the date when we got to seven tenths of an ampere consumption in the 16-candle-power lamp. I think we dropped from .94 to about .8 and then to .7. and it was years afterwards that the fifty watt lamp came out. You will have to get this kind of information from the lamp people. I probably will refer again to the incandescent lamp subject in my reference to the Edison Lamp Works.

work?

11. Do you recall much of the early electric railway
There is a tradition of your driving the old locomotive up to such a high speed that it jumped the track.

(Below is a copy of letter from T.C. Martin to Samuel Insull of November 20, 1908).

"With regard to our recent correspondence and the list I sent you of questions touching upon question number 11; but not clearly brought out there, I have been making some inquiries lately as to what became of the old Electric Railway Company of America, and there seems to be a good deal of vagueness and indefiniteness about the whole affair. I fancy you must have known a good deal about this as in: Raison's representative,

and can, perhaps, masy whether my deduction is right, viz., that it must have passed into the hands, in one way or another, of the General Electric Company. It looked at one time as though this night be a large and formidable concern, but I can discover absolutely no trace of its actual passing out of existence. I had a memorandum with regard to the subject but overlooked it in preparing the series of questions for you,"

When I arrived from England Edison had an electric railway in operation in Menlo Park, or rather, he had operated it in the summer of 1880. I arrived on the first of March 1881 and visited Menlo Park on the second of March, 1881. It must have been the following Sunday that I spent at Edison's house at Menlo Park and received my introduction to the electric railway. Nothing was running. The electric locomotive was in a small wooden building. The tradition about my driving the old locomotive up to such high speed that it jumped the track is untrue. Edison had one piece of track running on the level back of his laboratory and then he had another piece of track running down into a gulley or ravine, and, boy-like. I was playing on a handcar just at the head of the ravine and the handcar got beyond my control and dashed to the bottom. and was later on turned over to the junk man. That is the basis of the tradition that I drove the old locomotive at such high speed that it jumped the track. The fact is that the handcar jumped the track, the old locomotive was standing still in its shed and was not turning a wheel.

With relation to the questions asked in your letter of the 20th of November, Major Eaton can tell you all about the Electric Railway Company of America. The company was partly owned by the Edison Electric Light Company and partly by Thomas A. Edison and partly by Stephen D. Field. It languished. The Edison Electric Light people did not believe in the electric railway and did not want to spend any money on it. Edison was very anxious to so shead with his electric railway experimenting, and, probably in 1882, he got Mr. Henry Villard to put up the necessary money for experiments. I think Mr. Villard put up somewhere between \$15,000 and \$20,000. Edison turned the experimental work over to Charles T. Hushes. The locomotive which Charles T. Hughes built is, I believe, owned by the Pratt Institute of Brooklyn. The Association of Edison Wilminsting Companies borrowed it for the St. Louis Exposition. There are a few photographs of the old original electric locomotive still around. One. I remember. shows Charles Batchelor. Francis Jehl and wife, John Kruesi on it, and several others. This locomotive was broken up, so far as my recollection serves me. although as to this I am not absolutely sure. Edison probably knows.

The experiments which Charles T. Hughes had charge of and for which Villard paid, were run by Edison personally and the money Villard advanced was as a personal boan to Edison and was ultimately paid back to Villard by Edison. Later on

Stephen D. Field's interest in the Electric Railway Company of America was bought, I believe, by the Edison Electric Company, and if my momory serves me rightly, the Edison Electric Light Company went out of existence at the time the Edison General Electric Company was formed. I think Edison's advances for railway experiments (which should have been giabl paid by the Electric Railway Company of America) were reimburned to him by the Edison Electric Light Company sometime prior to the formation of the Edison General Electric Company. Major Eaton knows a good deal about this matter.

12% Anything about the various shops in New York or old "65" Fifth avnue - reminiscences of places, men and conditions.

13. Do you recall much about the removal to Orange and the creation of the new laboratory?

14. Would like something of the creation of Schemcotady. I told the technical story for you in the paper many years ago, but what I mean are the general inside events and facts It meant considerable investment and was a long way from Orange.

15. Would like something as to starting the old Harrison Lamp Works, and why "Harrison"?

I think this is probably a good place to give you a general idea of the various companies formed for the manufacture of the apparatus used in the developing of the

Edison electric lighting system and also of the various business organizations in connection with the development of the business. You should bear in mind that the Edison Electric Light Company was formed for the purpose of supplying Edison with funds for carrying on his experiments in connection with the development of an electric lighting system. His first great work was the invention of the high resistance incandescent lamp. At the same time that he was at work there were others/on incandescent lamps; Swan in England and Farnham in this country. But they were all working on the idea that what was necessary was a low resistance lamp and these lamps should be run in series. Edison was very early came to the conclusion that a series system was no system at all, that the proper thing to do was to develop a multiple arc system and he soon found that in order to run a multiple arc system successfully he would have to have a high resistance lamp. You will recall that his patent on the lamp is for a flexible filament of carbon of high resistance enclosed in a hermetically sealed glass globe from which the air has been exhausted. His early patents and feeders and distribution system show what a far-seeing engineering genius he is; and as you well know it is impossible to operate any commercial system except a series are system without following the broad engineering ideas contained in Edison's early system patents. Edison

 $\bar{C}$ 

was an enthusiast on the proposition. The gentleman who formed the Edison Electric Light Company, viz., Grosvenor P. Lowry of the firm of Porter, Lowry, Soren & Stone, was an enthusiast and his enthusiasm was shared by the early directors of the Edison Electric Light Company. As a result it was perfectly natural that as Edison's scheme of electric lighting system developed to a success the Edison Electric Light Company considered that they had the most valuable patent rights ever granted; and if you can get access to the early minute books of the Edison Electric Light Company you will find on their records a resolution, which I believe was proposed by Mr. Tracy Edson, one of their directors, to the effect that it was impolitic for the company to jeopardize its valuable patent rights by entering upon the manufacturing side of the business. This happened before I came to America. In the early days Edison had the idea that in addition to the protection of patents the manufacture of the lamp would probably be further protected by trade secrets, and he, with the cordial support of the board of the Edison Electric Light Company (who did not, as above stated, want to go into the manufacturing business anyway), worked out a scheme to form a company to manufacture lamps. This company was called the Edison Lamp Company. I think it was probably late in the autumn of 1880 that this company was formed. I remember Johnson writing

me about it from Menlo Park after he had closed his relations with the telephone business in London, and it was in August, 1880, that Johnson left England. That is how I fix the date of the formation of the Edison Lamp Company -late in the autumn of 1880. Edison's schome was to form a company of one hundred shares, each share being \$2500., and as I recall it, no stock being transferable except on the personal permission of Thomas A. Edison. Edison had a controlling interest, Batchelor had a ten per cent interest; I think Upton had ten per cent and I think Johnson had five per cent. This company had a shop at Menlo Park on the south side of the Pennsylvania railroad track, probably a quarter or one third of a mile east of the Menlo Park depot. The factory was later abandoned for the Harrison factory, to which I will refer elsewhere. Before lamps were made on a commercial basis the entire capital of the lamp company was wiped out, but ultimately restored from the profits of the business, and on account & the excessive prices charged gained a great reputation later on as a money making institution. Prior to my comming to America, in March 1881, another company had been formed with a capital of \$25,000, which company was to manufacture underground conductors known as electric tube. The company was called the Electric Tube Company. Edison was president, John Kruesi was treasurer and general manager and soon after my arrival in this country I was made the secretary. I believe I ultimately

1-

became secretary and treasurer, but I am not quite sure as to this. This company was owned one fifth by Edison, one-fifth by Kruesi, one fifth by Batchelor and the other two fifths is were owned by E.P. Fabbri and Mr. J. Hood Wright, who were partners of Mr. J.P. Morgan in the firm of Drexel, Morgan & Company. My recollection is that subsequently Edison bought out Mr. Fabbri's interest. On March 2nd, the morning after I arrived in this country. Edison, as I have already stated, took a lease of the Goerok street works and there was established the Edison Machine Works. The original money for this purpose was supplied ninety per cent by Edison and ten per cent by Batchelor. Edison had hoped to have associated with him in this matter some of his Wall street friends, notably those connected with the firm of Drexel, Morgan & Company, and possibly Mr. Henry Villard; but Mr. Edison, fortunately for himself and unfortunately for his friends, visited Wall street to get them interested in his machine works at a time when financial affairs were a little unsettled, and growing impatient at his financial friends for delaying a decision on the matter, he decided to finance the Edison Machine Works himself. This part of my story is from hearsay, as no interview with relation to interesting other parties in the Edison Machine Works took place after I came to this country. The capital for the Edison Machine Works was provided nine-Edison and 10 per cent by ty per cent by Batchelor. The concern did an extremely good

business for the first year or two of its existence and then languished for some time. Its subsequent development I will refer to later on. At the time the Edison Machine Works was formed Siegmund Bergmann was carrying on an electrical manufacturing business, making telephonic and telegraphic instruments and doing some experimental work in electric lighting sundries, such as switches, sockets, etc. His shop was on Wooster street. His only partner, so far as I know, at that time, was Edward H. Johnson. In 1881 Mr. Bergmann conceived the idea of purchasing the factory at the northwest corner of Avenue B and 17th street and asked Mr. Edison to join him in partnership. The assets of Bergmann & Company were valued and Edison put into the business an amount equal to one-half of the then value of the assets and the company was put into a corporation, Edison owning one third of the stock, Bergmann one third and Johnson one third; and Bergmann & Company, partly with the inventive skill of Barganus Edison, partly that of Johnson and partly that of Bergmann, developed all the miscellaneous articles required in connection with house wiring, such as sockets, insulating joints, switches, and they also made most of the electrical instruments used in central station switchboard work. I believe, however, that a few of the instruments were made by the Edison Lamp Company. You will see from the above that the Edison Electric Light Company owned the Edison patents for light and power, the Edison Lamp Company manufactured

[Page 24 is missing from the typescript at the Edison National Historic Site. This page is a photocopy of a variant typescript from Loyola University Chicago Archives: Samuel Insull Papers. It is reproduced with their permission.]

Edison Lamp Company manufactured the lamps and the Machine Works the heavy machinery, such as dynamos and motors, and the Electric Tube Company the underground conductors and Bergmann & Company the miscellaneous household supplies. The next step was the formation of the Edison Electric Illuminating Company of New York. The money subscribed to the capital of this company was subscribed by the stockholders of the Edison Blectric Light Company, of which Mr. Edison was the largest individual stockholder. This com many went actively to work to installa central station system, as I have mentioned elsewhere, in the lower portion of the City of New York, and I think you will find that the capital was one million dollars; thirty-five per cent of this to the Edison Electric Light Company for its patent rights and licensee agreement and the balance was subscribed for at par by the stockholders of the Edison Electric Light Company, as stated above.

The enormous labor of working out a practical application of Raison's distribution system to meet the business conditions existing in a business of which absolutely nothing was known at the time, which required a development of all of the apparatus used, from the steam engine to the lamp, is almost without parallel, and I think that the payment of dividends on the original capital of the Raison Recetive Illustrating Company of New York is as large a monument to Ir. Edison's genius as any work he has done.

consider that he and his associates in the manufacturing companies above referred to, are entitled to the credit of the success of the first plant of the New York Edison company. The men who are partly entitled to credit in this connection are Edison himself, Charles Batchelor, Edward H. Johnson, John Kruesi, Sicgmund Bergmann and Charles L. Clark, who at that time was chief engineer of the Edison Electric Light Company, and Francis R. Upton, in the order that I have named them. Whoever else may claim credit in connection with this enterprise are of minor consequence in my judgment; and I want thus formally to state my views on this particular subject at this time, because I consider the second only to Mr. Edison's invention is the success of the Edison Electric Illuminating Company of New York in the early days as one of the prime factors in the development of the electric light and power industry. The next institution formed was the Edison Company for Isolated Lighting. This company was formed for the purpose of exploiting the sale of isolated plants throughout the United States at a time when it was difficult to get capital into the central station business and prior to the commercial success of the central station business being established. This company was officered by the same people who officered the Edison Electric Light Company, and the company ultimately was absorbed by the Edison Electric Light Company. Later

10

on, when it was found very difficult to push the central station business, owing to the lack of confidence in its financial success, Edison decided to go into the business of promoting and constructing central station plants and he formed what was known as the Thomas A. Edison Construction Department, which he put me in charge of. The organization was crude, the steam engineering talent poor and owing to the impossibility of getting any considerable capital subscribed the plants were put in as cheaply as possible. I believe that this Thomas A. Edison Construction Department was unkindly named the "Destruction Department". It served its purpose, never made any money and I had the unpleasant Job of presiding at its obsequies. But the fact is that the capital that was put into the business under the influence of the pioneer work done by the Thomas A. Edison Construction Department has, like all capital put into the Edison electric light business, proven a remunerative investment to anybody who had the patience to await results. The years 1883, 1884, 1885 and 1886 were very lean years for the Edison Electric Company and also for the manufacturing concerns fathered by Edison; with the exception of the Edison Lamp Company and Bergmann & Company, the main business at that time was the esolated lighting business. Bergmann & Company made large profits and so did the Lamp Company, The Electric Tubs Company did so little business

during the time that the underground central station distribution was on trial and awaiting its final success, that one year the total gross business of the compeny was not sufficient to pay the watchman's salary, and as a result the Electric Tube Company, which had removed from 65 Washington street to the shops of Bergmann & Company, absorbed by the Edison Machine Works, and Mr. Kruesi had become assistant general manager of the Edison Machine Works and Charles Hatchelor was general manager. It was not until 1886 that the Edison manufacturing business in all its branches becomes a great success.

I have not the data at hand to give the exact date of the removal of the works to Schenoctady. As the business of the isolated lighting developed and the small contral station business began to show some life the Edison Machine Works on Goerok Street, together with the Electric Tube Works in Brooklyn, proved inadequate, and various sites were considered for establishing new shops. The Schenoctady Locomotive Works had been very successful and were owned and managed by Ellis Brothers. They had an old superintendent named Megusen, who left thom and with the assistance of, I think, the Albany and of the Stanford family, built the shops on the flats between the New York Central tracks and the rear loanal, just outside the city limits of Schenoctady. The se shape were never used. They had ten acres of land

attached and the property was offered to the Edison Machine Works on favorable terms. Partly influenced by the success of the Schenectady Locomotive Works in getting cheap labor and partly with the idea of developing a large industrial establishment where there was elbow room. Edison decided to acquire the shops of the McQueen Locomotive Works. There was the usual delay in closing down the old works and starting the new works. Batchelor was the general manager and Kruesi assistant general manager, and I was secretary and treasurer of the Edison Machine Works, my part of the business being to take care of the finances, and when the time came to move to Schenectady, I took quite an active part under Edison's instructions, in moving the plant, and a short time afterwards Mr. Charles Batchelor resigned the general managorship and became vice president and I was elected general manager and treasurer. John Kruesi was assistant general manager and was my principal and close associate and friend and worked loyally with me in the development of the Schenectady plant. At Mr. Edsson's request I moved to Schenectady so as to be more closely in touch with the business. I think when we went there we took 250 men and when the plant was turned over to the General Electric Company in 1892, there were over 6000 men employed.

To go back a few years in the development and to refer to the incandescent lamp manufacturing, the Edison

Lamp Company was the first of the manufacturing companies to have first class manufacturing quarters. Harrison was picked out because of its closek; proximity to Newark, which is a good labor market, and the Harrison works were bought because they were convenient for business and could be acquired for a reasonable price. These establishments worked closely in connection with Edison, whose experimental work was removed from Menlo Park to the top floor of Bergmann & Company's building at 17th street and Avenue B, directly after Bergmann & Company acquired that property. In the mean time Edison's first wife had died and he had married again, and he had purchased Glenmont, Liewellyn Park, Orange, as his residence. In was during the days that I was engaged in the building of the Schenectady Works that Edison built his laboratory at Orange. This work he did himself, Batchelor in the mean time building and equipping the Edison Phonograph Works on property adjoining the laboratory. Naturally as the electric light business developed the Edison manufacturing companies prospered. The Edison Electric Light Company had pursued the policy of accepting securities in local illuminating companies for their patent rights. The cash income of the Edison Electric Light Company was small and there was more or less jealousy of the success and influence of the Edison manufacturing estab-

lishments. In was sought to grip this influence by subjecting them to licenses agreements, which agreements it was intended should cover the cost of mamufactured articles to licensees of the Edison Electric Light Company. The situation became an entangled one and on the negotiation of Henry Villard, with the assistance of Siemans & Halske and the Deutsche Bank of Berlin and some other European capitalists and the firm of Drexel, Morgan & Company of New York, the Edison Machine Works, which included the Electric Tube Company, the Edison Lamp Company and Bergmann & Company, was merged with the Edison Electric Light Company under the name of the Edison General Electric Company. I think this took place in 1890. You probably have the dates of this consolidation. My recollection is that the Edison manufacturing establishments got about one half the capital and the stockholders of the dogen electric light mompanies and the other half of the capital with a certain reservation of capital over each interest, which went to the parties who provided the cash requirements for developing the business. By this time Charles Batchelor had retired from business; Mr. Henry Villard was elected president of the Edison General Electric Company and he was assisted in the financial affairs by J. H. Herrick as vice-president and I was elected second vice president with charge of the manufacturing and selling departments.

The story as I have dictated it refers mainly to the people on the manufacturing side of the Edison electric light business. Amongst the principal men on the Edison electric lighting side of the business should be mentioned Mr. Grosvenor P. Lowry. Mr. Edison's acquaintance with Lowry came through his relations with the Western Union Telegraph Company; and in the early days, mainly before I came to America, Lowry was probably about the most active man in securing the cooperation of financial people, who gave Edison support in his electric lighting experiments through the agency of the Edison Electric Light Company. I do not know who was the first president of the Edison Electric Light Company, but in my time S.B. Eaton was its president. As I recall it, he was elected sometime in the fall of 1880 or 1881. For years as president of the Edison Electric Light Company and as Mr. Edison's personal counsel, Major Eaton and his firm, Eaton & Lewis, took a very active part in the business. When I became practically the active head of the Edison General Electric Company, Major LEaton's partner, Mr. Eugene H. Lewis, acted asmy confidential counsel, and much of what I was able to accomplish in connection with placing central station business was owing to the very able cooperation on the legal side of affairs which I received from Mr. Lewis. Another gentleman who was active in the busness in the early days was Calvin Goddard, who was secretary, and, I believe, treasurer of the Edison Electric Light

Company, the Edison Company for Isolated Lighting, and also of the Edison Hoctric Illuminating Company of New York. I believe he died in 1883 or 1884.

16. Anything about distinguished visitors to the two laboratories while you were managing.

19. Any reminiscences of Villard, J.P. Morgan, or Jay Gould, or Vanderbilt, etc., in connection with Edison.

You ask me about distinguished visitors visiting the laboratories while I was managing Mr. Edison's affairs. I used to be so busy that, although I came in contact with everybody who visited him, including President Diaz, Lord Kelvin (then Sir William Thomson), Sir William H. Preece, James Gordon Bennett and the Duke of Marlborough, and all kinds of men of prominence or distinction of family from all over the world, I do not know that I call to mind any particular reminiscences of any of them. We had a great many prominent visitors and as a result these visits became mere commonplace incidents. Moreover I question whether this side of men or things appealed to me particularly; I was more interested in the development of the business and the success of the manufacturing establishments; my duties; ninnthe earlier days of financing these establishments in their infancy and later on of managing and developing the large business

#### [ENCLOSURE]

1

at Schenectady and, still later on, the organization and management of the manufacturing and selling departments of the Edison General Electric Company, were matters which interested me more and impressed me more than the meeting with prominent people. So far as New York financial people are concerned, I think that if I were naming those to whom Edison is under the greatest obligation, I should name the house of Drexel, Morgan & Company, or, as it is today, J.P. Morgan & Company. In the early days Edison received the warm personal friendship and assistance of Mr. E.P. Fabbri and J. Hood Wright. Later on Mr. C.P. Coster became the really active man when it came to questions of policy in guiding the affairs of the Edison Electric Light Company and the Edison General Electric Company, and at all times Mr. Edison has had the warm regard and, when he desired it, financial cooperation of J P. Morgan. Amongst the financial men whose close personal friendship Edison enjoyed. I would mention Henry Villard, who, I think, had a higher appreciation of the possibilities of the Edison business than probably any man of his time in Wall Street. He dropped out of the business at the time of the consolidation of the Thomson-Houston with the Edison General Electric Company; but from the earliest days of the business, when it was in its experimental period, when the Edison light and power system was but an idea, down to the day of his death Henry

# [ENCLOSURE]

Villard continued a strong supporter of the business, not only with his influence but also with his money. He was the first capitalist to individually back Mr. Edison's experiments in electric railways, although prior to his advancing Edison woney the Edison Illuminating Company had also spent some of the money in its treasury.

Mémorandum by Samuel Insull' on Chapter Mine, headed "The Telephone Motograph and Microphone", copy of which was sent him by Mt. T. Commerford Martin,

In pages twelve and thirteen you tell the story in Mr. Edison's ow language of his sale of the motograph patents to the Wostern Union

Telegraph Company. Mr. Edison says the amount was \$100,000.00. This is currect, but he goes on to say later that it was paid at the rate of \$6,000. a year for seventeen (17) years. This I believe is incorrect. This particular transaction, my recollection is, was paid \$10,000.00 a year for ten (10) years, the payments being monthly, \$833.33 per month. The check was the Western Union Telegraph Company's check, if my memory serves me currectly. The \$6,000.00 payment is the one referred to by Mr. Edison on page ten. This was the \$6,000.00 a year paid for seventeen (17) years by the American Speaking Telephone Company. This chook was paid monthly. \$500.00 por month, and the check came from the Gold & Stock Telegraph Company, which Company owned the American Speaking Telephone Company. A reference to Mr. Edison's accounts in his laboratory office anytime during the early eighties would tell you whether my memory is correct, or whether Mr. Edison's statement in the Chapter on the Telephone, Motograph and Minrophone is correct. My recollection is that I used to get the two checks

per month, one for \$500.00 from the Gold & Stock Telegraph Company and the

110 . It was \$583.33 fer month. other for \$833.33 from the Western Union Telegraph Company, or a total of \$1333.33 monthly. As a matter of our lesity I would like to know whether my manory servos me correctly or not.

Referring to the story as told by Mr. Edison on pages thirteen and fourteen with relation to the actograph telephone receiver, called the loud speaking telephone, when I first went into Colonel Couraud's service as his private secretarly in January 1879, the story told around the office was that when the trouble came up with reference to the possible Bell little gation on the magneto receiver. Colonel Couraud telegraphed Mr. Edison explaining the trouble, and oppressing a fear that an injunction would issue in favor of the Englis Bell Company against the use of the magneto receiver. Mr. Edison replied promptly by cable as follows: "I will invent and ship a new receiver." Understand, that this cable correspondence must have taken place just before Christmas, 1878, and my knowledge of it is heresay as I did not enter Colonel Gouraud's service until January 1879.

On page fourteen you quote Mr. Edison as follows: "I made six of these ressivers and sent them in charge of an expert on the first steamor". The expert show Mr. Edison sent was Mr. Charles Edison, his nephew. It must have been in February or early in March, 1879. I went to Euston Station early one morning before daylight to meet Charlie Edison,

as we called him later. I had never seen him but presumed I would be able to find him because of his clothes and appearance, that is, I expected that he would look distinctly American, and Americans you must remember were not so common in 1879 in Ergland as they are today. Charles Edison strongly resembled Mr. Thomas A. Edison, as shown in a picture of Mr. Edison taken in Washington with U. H. Painter and Charles Batchelor with a phonograph in the foreground. You probably recollect the picture. Charlie Edison had with him the first motograph receiver and his motograph receiver was the salvation of the Edison Telephone business in England. At that time in London there was a man named James Adams, whom I remember mmainly for his picturesque blasphemy. Mr. Edison had sent James Adams over to England some time in the later part of 1878 to operate the telephone My fecollection is that Charles Edison was only in London a few months. He was in more or less bad health and went on the continent, I think, just about the time Mr. Edward H. Johnson arrived in England. Johnson arrived there on July 14th, 1879.

# WILLIAM H. MEADOWCROFT PAPERS

REMINISCENCES BY EDWARD H. JOHNSON

425 - 5th Avenue.

New York, Nov. 21, 08

My dear Martin:

Delany's reminscences are only legendary when he gets back of his personal experience.

My entrance preceded Edison's in the field of auto-telegraphy as the following "true story" will show. Its interests, of course, turn solely on the light it throws on The Edison of that day.

Gen. Wm. J. Palmer and some New York associates had taken up the "Little auto system and had expended quite a sum in its development, when, thinking they had "reduced it to practice, they got "Tom" Scott of the Penn. R.R. to send his Supt. of Telegraph over to look into and report upon it.

Of course, he turned it down. The P.R.R. was "It" in those days, and while we did'nt know it then we now know that the policy of the "It" is always to discourage innovation. This was the winter of 69-70. The syndicate was appalled at this report, and in this extremity Gen. Palmer thought of the man who had impressed him as "knowing it all" by the telling of Telegraphic Tales as a means of whiling away lonesome hours on the plains of Colorado where they were associated in Railradd building, and so this manthat's me - was sent for to come to New York and assuage the grief by evolving a star of hope in their firmament, if there possible.

My "report" was that the system was sound fundamentally, that it contained the germ of a "good thing" but needed working out. Thereupon the query arose, Who? Associated with Palmer was one Col. Josiah C. Reiff, then Eastern hond agent for the Kan. Pac. R.R. The Col. was always resourceful and did'nt fail in this case. He knew of a "young fellow who was doing some good work for Marshall Leffrets of the Gold & Stock Tel. Co. (the Ticker) and who it was said was a genius at invention and a very fiend for work. His name was Edison and he had a shop out at Mewark, H.J." "Yes" quoth I "I've heard of that shop and I'm thinking he's your man". So Col. Reiff wrote and asked him in.

He came and was put in my care for the purpose of Autual Exchange of Ideas and a report by me as to his competency in the matter.

This was my introduction to Edison.

He confirmed my view of the auto system. He saw its possibilities, as well as the chief obstacles to be overcome, vix: The "uluggishmess" aff the wire together with the need of mechanical betterment of the apparatus employed, and agreed to take the job on upon one condition, viz: that that man Johnson stay and help as "He was a man with ideas".

En parenthesis contrast this state of mind with that of the later day Edison of whom Delany so delightfully and truthfully speaks - "had too damned many inventors alroady". I've heard him many a time indulge in the same sentiment,

as for instance when he would say "I don't want ideas, I want work", and "I've more ideas of my own now than I can ever work out, I don' want to borrow any", etc. etc. Reverting - It was accordingly arranged that Edison should take up the work at onc, and that I should be given a 3 months leave from my Colorado Railread building - (it was then the Denver & Rio Grande) - and unite with Edison in this work. I never saw Colorado since, but I've seen a lot of Edison. -- another parenthesis -- Note Delany's confirmation of my tale about the auto system & Jay Gould. The W.U. would'nt have it, but Jay made the Vanderbilt's give him the W.U. for it - at least that's practically what the transaction amounts to.

Edison sold his quadruplex to Jay Gould quite independently of the auto transaction and received \$40,000 for it.

The auto people subsequently made a claim that the quad belonged to them under this agreement with Edison for all inventions "applicable to " automatic telegraphy - this issue became the crux of a legal battle in which many experts were requisitioned. Edison was one - D'Infreville another, and I a humble third. Gen. Ben Butler, Grosvenor P. Lowry & Edward F. Dickerson were some of the Big Legal Luminaries engaged. Gould won for all practical purposes, since he and his successors have managed to keep the case

in the courts ever since. Edison's auto & quad work was not immediately succeeded by the electric lighting, but by the carbon telephone and incidentally the "motograph telephone" and the phonograph - then came the Light Subdivision - glorious epoch.

> So much for a review of Dekany. Now for a few words of my own.

The Centennial exhibit at Philadelphia in 1876, Sir Wm. Thomson's visit, I remember were bringing the Thousand words - with a few to apere - over the wire from New York in 57 seconds, and Sir William's delight at the clearness of the recorded characters. He took the roll as it came from the instrument, and it became a treasured memonto to his Laboratories at Glasgow. On the occasion of this visit, Bell's telephone was also inspected and I recall the very great reluctance shown by Sir Wm. to admitting that he heard an articulated word - Watson, Bell's Asst, urged the savant to "listen carefully" and after many efforts the concession was finally made. "Yes, I think I heard it all right."

Now, as to the Phonograph exhibits in New York. I am very hazy. There were many of them. Hilbourne Roosevelt, Charlie Cheever, Gardiner G. Hubbard, W.H. Painter, a man by the name of Bradley from Rhode Island and myself were the original Phonograph Syndicate or corporation, and I had charge of exhibits. I made many, and I have an indistinct recollection of the telephone connection with

Roosevelt's organ factory, the organ recital, etc., but I shall have to talk these things over with some one who can recall them before I can contribute much in that line.

The Phonograph exhibit you speak of was at 14th Street & Fifth Avenue. I can not sure whether it was the first or not. The man "Yates", Edison speaks of was "Yout" and the "type setting" machine was the original "Typewriter" if I am not mistaken, and the association was with the auto telegraph and not with the phono. At least I have no recollection of a type setting machine, while I have a clear recollection of the "original Jacobs" of the modern typewriter. It was an invense wooden affair and was being developed as a means for quickly translating the telegraphic characters from the chemical strip to type printed sheets. But this may not be what is in Edison's mind. It is an interesting point, however. Delany and Edison will both re-

If you will submit material to me I will review it as I have delany's and may in that way contribute not a little, while incapable of original recollection of value.

call it.

Yours truly, (Sd.) E.H. Johnson.

Col, J.C. Reiff is still living and has a memory like an engraved stone. I've no doubt he and I could evolve much. I'll have a talk with him.

E.H.J.

p.S. I can give you the true origin of the phonograph if Edison does not object. Its interesting but there's a foolish notion I think in the Old Man's mind that it in some way detracts from the honour and credit due him. As a matter of fact it does'nt in the least, and it is a heap more interesting than the cooked up tales that Ton, Dick and Marry have invented.

Selany was me of eld true niventros of telegraph expansives. TAE had great regard for turn.

# WILLIAM H. MEADOWCROFT PAPERS

REMINISCENCES BY WALTER S. MALLORY

#### EDISON PORTLAND CEMENT COMPANY

P.O. Adress, Stewartsville, N.J.,

June 8, 1908.

Mr. T.C. Martin, 239 West 39th Street, New York, N.Y.

Dear Mr. Martin:-

I beg herwith to enclose four additional stories, per my recent promise. Have you among the stories already submitted to you any mention of the arrangement between Mr. Edison and the Edison Lamp Works. covering the cigars which they voted to give him and which were given him for a number of years. There are so many people who know this story that the chances are you have already received it. If not , I will be glad to send it to you.

> With kindest regards, I am, Yours very truly, (Sd. I W.S. Mallory.

The problem of concentrating low grade iron ore was started at the time iron ore was selling at about \$6.50 per ton. Before the plant was in shape to attempt to run commercially, the large deposits of steam shovel iron ore at Maxim Mesaba were discovered and opened up, and when the plant was put in commercial operation, iron ore was selling for about \$3.50 to \$3.75 per ton, and it was found there was strong probability that with such a low market price the scheme could not be worked out to a commercial success. Mr. Edison then turned his attention to utilizing the experience and knowledge he had gained in the work on the iron ore proposition, and applied it to the manufacture of Portland Cement, and designed and built the large works now located at New Village, N.J., which have a capacity of over 8000 barrels per day.

The funds for the iron ore concentrating problem were largely furnished by Mr. Edison, and over two million dollars was spent in the attempt to solve the iron ore problem. During the boom times of 1902, when General Electric sold at its high-water mark of about \$330, Mr. Edison and the writer were on their way from the cement plant at New Village to his home at Orange, N.J. When we arrived at Doyer, N.J., we got a New York paper and the writer called Mr. Edison's attention to quotation on General Electric of that day. Mr. Edison said, "If I hadn't sold any of my General Electric, what would it be worth Soday?" and the writer after doing some figuring

replied, "Over four million dollars". When Mr. Edison is seriously thinking of a problem, he is in the habit of pulling his right eyebrow, which he did for 15 or 20 seconds, then his face lighted up and he said, "Well, it is all gone, but we had a hell-of-a-good-time spending it".

#### - STORAGE BATTERY WORK -

When Mr. Edison first started actively on the work out of which resulted the present storage battery, he said to the writer that he had only one determination, and that was absolutely not to work with lead and sulphuric acid, but that he had the feeling that what he wanted to accomplish ought to be found in a combination of nickel and iron. His method of working was as follows:

In one of the chemical laboratories he had eight or ten chemists and experimenters, and in the rear room in this building Mr. Edison had a bench which was about three feet wide and twelve to fifteen feet long, on which he had hundreds of little test cells, the material in which had been made up by the chemists and experimenters under his directions. During the period of this work and for over a year Mr. Edison's schedule of work was as follows: He would reach the Laboratory between 7:30 and 8:00 A.M., his lunch would be sent to him from his home at noon, then at half past six the carriage would come for him and he would be driven to his home for dinner, then by eight o'clock he would return and the carriage would come for him at midnight and would frequently be one, two or three o'clock before he would go home, and on very many occasions the carriage, after waiting until three o'clock, would be sent home and what little sleep Mr. Edison would get would be obtained at

-1-

the Laboratory. This schedule went on six days a week, and for very many weeks seven days. The larger part of the time Mr. Edison would be seated before the table already mentioned, testing, figuring, planning, getting practically little or no exercise, and for weeks and months apparently not getting any results from the materials with which he was testing.

After the experiments had gone over 9,000, the writer allowed his sympathy to get the better of his judgment, and said to Mr. Edison: "isn't it a shame that with the tremendous amount of work you have done, that you have not been able to get any results", and thr. Edison looked up and smiled, saying: "Results? Way, I have gotten a lot of results. I know several thousand things that won't work."

#### - AUTOMOBILE REPAIRS -

About two years ago the writer had a motor car of a make of which Mr. Edison had already had two cars, and when the car was received he made inquiry as to whether any repair parts were carried by any of the various garages in Easton, Pa., and learned that this particular car was the only one of its kind in Easton.

Knowing that Mr. Edison had had an experience lasting two or three years with this particular make of car, the writer determined to ask him for information relative to repair parts, so the next time I was at the Laboratory, I told him I was unable to get any repair parts in Easton and that I wished to order some of the most necessary, so in case of breakdowns, I could not be compelled to lose the use of the car for several days until repair parts could be had from the factory, and asked his advice as to what I should order, to which he replied: "I don't think it will be necessary to order an extra top".

#### - A GAME OF BILLIARDS -

Along in the latter part of the '90s, when the work of the problem of concentrating iron ore was in progress, it became necessary when leaving the concentrating plant at Edison, N.J., to wait over at Lake Hopatong one hour for a connecting train. During some of these waits Mr. Edison had seen the writer play billiards. At the particular time in which this incident happened, Mrs. Edison and her family were away for the summer and the writer was stopping at Mr. Edison's home.

One hot Saturday night, after Mr. Edison had looked over the evening papers, he said to the writer, "Do you want to play a game of billiards?" Naturally this astonished me very much, as Mr. Edison is a man who cares little or nothing for the ordinary games, with the single exception of parchesi, of which he is quite fond. I naturally said "Yes, I would like to play", so we went into the billiard room of his home and the writer took off the cloth, got out the balls, picked out a cue for Mr. Edison and when we banked for the first shot the writer won and started the game. After making two or three points he missed, and a long carum shot was left for Mr. Edison, the cue ball and object ball being within about twelve inches of each other and the other ball a distance of nearly the length of the table. Mr. Edison attempted to make the shot but missed it and said: "Put the balls back", so I put them back in the same

-2-

position and he missed it the second time, and I continued, at his request, to put the balls back in the same position for the next fifteen minutes, until he could make the shot every time, then he said: "I don't want to play any more".

I like to tell this story, as it illustrates the ever-present determination to conquer whatever he undertakes.

#### - AN ELABORATE LUNCH -

Some years ago, we had on a business nagotiation in New York, which made it necessary for Mr. Edison and the writer to visit New York five or aix times within a com\_partively short period. It was ourcuston to leave orange about 11:00 A.M., and on arrival at New York to get our lunch before keeping the appointments; which were usually made for two o'clock. Several of these lundnes were had at Delmonico's, Sherry's and other places of similar character, but on the day in question, while enroute from Orange to New York, Mr. Edison said: "I have been to lunch with you several times, now today I am going to take you to lunch with me, and give you the finest lunch you have ever had". I asked him, "Where are we going?" to which he replied, "You wait and see".

When we arrived at Hoboken we took the down-town ferry and when we arrived on the New York side, Mr. Edishan led the way to Smith & McNell's, which is opposite Washington Market. We went inside and as soon as she waiter appeared Mr. Edison ordered apple dumplings and a cup of coffee for each of us. He consumed his with the greatest possible pleasure, then as soon as we had finished he went to the cigar counter and purchased a cigar, and as we walked to keep the appointment, he told me the following story:

When he left Boston and decided to come to New York

he had only money enough to reach New York. After leaving the boat, his first thought was a breakfast, but he was without money to obtain it. However, in passing a wholesale tea house, he saw a man tasting tea, so he went in. and asked the man if he might have some of the tea, which the man gave to him and in this way be obtained his first breakfast in New York. He knew a telegraph operator in New York and on him he depended for a loan to tide him over until such time'as he obtained a position. During the day he succeeded in locating this operator but found that he also was out of a job and that the best he could do was to loan Mr Edison one dollar, which he did, this amount of money representing both food and lodging until such time as a position could be obtained. Mr. Edison stated that after the time consumed and the result of the exercise from walking while he was locating his friend, that he was extremely hungry and that he gave most serious consideration as to what he should buy in the way of food and what particular kind of food would he most satisfying and filling, with the result that he decided on an apple dumpling and a cup ofcoffee, which he had at Smith & McNell's. He was fortunate enough the following day to obtain a position, so that he was then able to live in a normal way.

## A MEASURE FOR MEDALS -

During the winter preceding the last World's Fair. a European Scientific Society advised Mr. Edison that it had voted him a Gold Medal for his scientific work, and their representative would stop on his way to the Fair and deliver the Medal in person. During July or August of the following year, on an exceedingly hot day, their representative called at the Laboratory and tried to get the Gate House man to take his card to Mr. Edison. This man has had many years' experience in meeting visitors and he tried to learn the business of the representative, who spoke English very imperfectly and very rapidly. As the Gate House man was unable to learn the mission of the visitor, who seemed from his dress and manner to be a person of some importance, he came to the office of the writer and told him the circumstances, and asked him to look the visitor over. When the writer reached the Gate House, he found the visitor red in the face, with the perspiration rolling off of it in streams, and very much excited, and he let forth a torrent of talk of which the writer was unable to understand anything except that he caught the word "Medal". Happening to remember the letter of the previous winter, I asked him if he was the representative of the Scientific Society, and he was so glad to be identified that he nearly fell on my neck, so I invited him into the Library and apologized for the

delay in his obtaining entrance, explaining to him the many schemes that had been tried to obtain entrance in the Laboratory. When he was somewhat cooled off, I went upstairs and found Mr. Edison on the second floor of the Laboratory in the furnace room, where he was conducting some experiments with carbon. As already stated, the day was intensely hot, and I found Mr. Edison in a sad-looking state. He had on as few clothes as possible and his hands and face were streaked with the carbon with which he was working. I explained to him that the representative from the Scientific Society, from whom he had heard the previous winter, was in the Library and was ready to deliver the Medal. Mr. Edison declined to go downstairs, saying to me "You take it, and explain to him that I am very busy with an experiment, which I cannot very well leave." I protested, but Mr. Edison said: "No, I will not go down", so I went down to the Library and explained to the representative that Mr. Edison was very busy in the midst of a very important experiment which he could not leave, and that he had instructed me to take the Medal. The representative of the Scientific Society very justly declined to deliver the Medal to me, saying that if he couldn't see Mr. Edison on that day he would come the following day, or any other day which we would appoint. Knowing that it might be just as difficult to meet Mr. Edison on a subsequent day, I returned to the second floor and told Mr. Edison what the representative of the Scientific Society had

said tw as to making another call, then I said: "You can see him just as well today as later; now, if you do not want to go downstairs, let me bring him up into the furnace room and see him here," to which Mr. Edison replied: "No, I won't have him up here, and if I've got to see him I suppose I will have to go downstairs", So. just as he was, all perspiration and dirty, he accompanied me to the Library and I introduced him to our visitor who seemed to be very much shocked at his appearance. He however took the Medal out of his pocket and started in and made quite an elaborate speech of presentation, which was delivered so rapidly, and his English was so poor; that neither Mr. Edison or the writer understood one word of it. When he had finished, he handed the Medal to Mr. Edison, who took it and simply said "Thank you". There was a pause, and then with the evident intention of making conversation, our visitor said in broken English but slowly enough so that both Mr. Edison and the writer understood: "I believe, Mr. Edison, you have other Medals", to which Mr. Edison replied: "Yes, I have a couple of quarts of them up at the house", which it is needless to say astonished our visitor very much and he subsequently mentioned the fact to me severah times that he could not see how a man could value Medals by quarts.

#### **IATTACHMENTI**

#### - A FINANCIAL TRANSACTION -

From the proceeds of the sale of the stock of the General Electric Company which Mr. Edison received at the time of the consolidation of the Edison General Company a and the Thompson-Houston Company for his stock in the former Company, Mr. Edison started on the problem of concentrating low grade iron ore and established works at Edison, N.J., where he personally worked for a period of eight or nine years. The work was of the most trying nature, the number of disappointments far outnumbering those of success, and Mr. Edison's working hours for six days a week averaged the above period fully 17 hours a day.

During the latter part of the panic in 1893, there came a period when we were very hard up for ready cash due largely to the panicky conditions, and a large payroll had been raised with considerable difficulty. A day or two before pay-day, our Treasurer called me up by 'phone and said, "I have just received the paid checks from the bank, and I am fearful that my assistant, who has forged my name to some of the checks, has absconded with about \$3000." I immediately went to Mr. Edison and told him of the forgery and the amount of money taken, and in what an embarrassing position we were for the next pay-roll, and when I had finished, he said,

"It is too bad, the money is gone, but how can we turn the loss of it to our advantage?" Then continuing, he said, "I tell you what you do; go and see the President of the Bank which paid the forged checks, get him to admit the Bank's liability and then say to him that Mr. Edison says he does not think the Bank should make good the loss because he happened to have a dishonest clerk in his employ". "Also say to him that I shall not ask them to make the amount good". This was done, the Bank admitting its liability and being much pleased with Mr. Edison's action. When I reported to Mr. Edison what had been done, he said: "Wait a couple of weeks, then go down and strike them for some good sized loans," which I did and obtained, and the loans were of the greatest possible help to us at that particular time.

Personally, this little experience has been of the greatest possible aid to me, as whenever I get up against an adverse unexpected situation, the first thought which comes to my mind is, "It is too bad, but how can I turn it to my advantage."

# WILLIAM H. MEADOWCROFT PAPERS

REMINISCENCES BY FRANCIS R. UPTON

# Mr. J. R. Upton's

- PEMORANDUM REGARDING THOMAS A. EDISON -

Mr. Martin writes me regarding my reminiscences.

I first saw Mr. Edison in 1877 when I went to Menlo
Park from Princeton with Mr. Howard R. Butler, I found Mr. Edi
son busily engaged on telephone work and beginning to get some
results.

The next year, after I had been to Germany for a year studying under Helmholtz, I again saw Mr. Edison. He had offered Mr. Butler a position as Assistant, desiring a trained wan. Mr. Butler passed the position on the I was engaged by the Company which was backing Mr. Edison at the time, as a wathematician in my testimony in the filarent case is an account of my I not interview with Mr. Edison and the questions I asked.

I found Mr. Edison at that time wonderfully familiar with the electrical laws. His knowledge was far ahead of any text book knowledge, as his experience in inventing the quadrature and the automatic telegraph, had given him a very clear insight into the laws of E.M.P. and of resistance of circuits. He had from experience completely scalized the effect of high resistance and low resistance in combination with batteries of various attention.

#### **IPHOTOCOPYI**

What has now been made clear by means of accurate nomenclature was then very foggy in the text books. Er. Edison had completely grasped the effect of sub-division of circuits, the and the influence of wires leading to such sub-divisions, when it was most difficult to express what he knew in technical language.

The accurate nomenclature was found only in higher treatiffs on electricity such as were contained in the encyclopaedia Brittanica and in the German text books.

I remember distinctly that Mr. Edison gave me the problem of placing a motor in a circuit in multiple are with a fixed resistance, and I had to work the problem out entirely as I could find no prior working out of this problem. There was nothing that I could find bearing upon the counter E.M.F. of the armature and the effect of the resistance of the armature on the work given out by the motor.

It was a wonderful experience to have problems given me out of the intuitions of a great mind, based on enormous experience in practical work, and applying to new lines of progress.

One of the main impressions left upon me after knowing Mr. Edison for many years, is the marvelous accuracy of his guesses. He will see the general nature of a result long before it can be reached by mathematical calculation.

Mr. Edison's greatness was always to be clearly seen then difficulties arose. Difficulties always seemed to make

him cheerful and start him thinking, and very soon would come a line of suggestions which would not end until the difficulty was met and overcome or found incurmountable.

I have often felt that Mr. Edison purposely got himself into troubles by premature publications and otherwise, so that he would have a full incentive to get himself out of the trouble.

Another point about Mr. Edison in his experimenting.

His day mf is twenty-four hours long for he always has worked whenever there was anything to do, whether day or night, and carried
a force of night workers so that his experiments could go on
continually. If he wanted material he always made it a principle
to have it at once, and never hesitated to use special messengers
to get it.

I remember in the early days of the electric light he wanted a mercury pump for exhausting the lamps. He sent me to Princeton to get it; I got back in the evening to Metuchen and had to bring the pump to the Laboratory on my back that evening, set it up, work all night and the next day, getting results.

The development of the electric lamp is well told in the testimony given in the filament lamp case.

There were two or three things that I feel especially proud of in this development. One is that when the first carbon filament lamps were rade, the question was often asked whether they would flicker when one lamp was put in multiple with another. It was my privilege at that time to have in my hands the second carbon filament lamp when there was another one still in burning. Condition. I remember very well hapf

a table in the middle of the laboratory upstairs at Menlo Park, and then lighting the second lemp along side of it without affecting the first lamb.

I know this would be the case, as the low resistance armature was in the dynamo, the circuits were of low resistance and the lamp was of high resistance and the galvanometer also demonstrated that there would be no change or flickering in the first lamp when the second was lighted.

Another incident at Menlo Park was that the first lights placed in a dwelling house were placed in my house exposite the station. This happened to be the case because the wire had been run down there first, and had not been run to Mr. Edison's house. The result of this was that the first illumination of a private room was rade in this house by means of a filament lamp.

In this house Mr. Grosvenor P. Lowrey suggested hanging-the lamps high up on the walls in the corner of the rooms. This was done first in the room on the north side of the house.

Another installation which I had to do with was that of the steamship Columbia. I took the lamps personally in a basket for this installation, and had charge of the installation. Mr. Wilson P. Howell was on the boat under me in charge.

During the invention of the incandescent tamp, though ir. Edison was under great strain and working paretically all the time, he was usually in good spirits, and would often in the middle of the night when the luncheon was served, go to the organ

at the end of the Laboratory and play tunes and come back and crack jokes.

Mr. Charles Batchelor was Mr. Edison's principle assistant at that time. He was a most intelligent, patient, competent and loyal assistant to Mr. Edison. I remember distinctly seeing him work many hours to mount a small filament, and his hand would be as steady and his patience as unyielding at the end of these many hours as it was at the beginning, in spite of repeated failures. He was a wonderful mechanic, and the control that he had off his fingers was marvelous, and his eye sight was sharp. Mr. Batchelor's judgment and good sense were always in evidence.

Mr. Kruesi was the Superintendent. He was a splendid mechanic with a vigorous temper, wonderful ability to work continuously, and to get work out of men.

and Kruesi. Mr. Edison with his wonderful flow of ideas, which were sharply defined in his mind as can be seen by any of the sketches that he made, as he evidently always thinks in three dimensions. Mr. Kruesi, willing to take the ideas, and capable of comprehending them, would distribute the work so as to get it done with marvelous quickness and great accuracy. Mr. Batchelor was always ready for any special fine experimenting or observation, and could hold to whatever he was at as long as Mr. Edison wished him to, and always brought to bear on whatever he was at the greatest skill.

#### **IPHOTOCOPY**

Mr. Kruesi was a Swiss and trained in the best Swiss ideas of accuracy. 17. Butchelor was an Englishman and came to this country to set up the thread weaving machinery for the Clark Thread works.

I have often felt that Mr. Edison never could comprehend the limitations of the strength of other men, as his physical and mental strength have always seemed to be without limit. He could work continuously aslong as he wished and had sleep at command. His sleep always was instant, profound and restful. He has told me that he never dreamed. I have known Mr. Edison now for thirty years, and feel that he has always kept his mind direct and simple, going streight to the root of troubles. He also has kept a warn feeling of reg ard for his old associates, and a great many times has done great kindnesses to those who have been associated with him. always in an inconscience way.

One of the peculiarities I have noticed about Mr.
Edison is that I have never known him to break into a conversation going on around him and ask what people are talking about.
The mearest he would ever come to it was when there had evidently
been some joke told and his face would express a desire to laugh,
that would immediately invite telling the joke to him.

Regarding the creating of the lamp works. When Mr. Eddson had made a number of lamps he began illuminating Menlo Park. The class work of the lamps were first made for this in the photographers house on the north of the Laboratory by Messus.

Boehn & Holtzer, the exhaustion of the large was carried on in the east end of the laboratory upstairs, where the mercury pumps were. Mr. W.J. Harwer kept the records of the large for some period.

Mr. Batchelor took up the larp manufacture and method of manufacture. He started the work in the old "Pen Factory" as it was called, on the other side of the railroad from the Laboratory.

In the exhaustion of the lamps mercury was used freely and appliances were poor, and the merfury got all through the building. The result was that Mr. Batchelor and several others were badly salivated. The charge of making lamps was turned over to me and Mr. Batchelor was sent to Paris.

At this factory the present basis of the lamp was gotten up and standards fixing this base were sent to England
Prance and Germany, where lamps were being made: The works were moved to Harrison and I continued in charge for several years until such a time as the business had grown to what then seemed to be large dimensions. At the Henlo Park factory, Prof. Hichols who is now at Cornell was in charge of the photometric work.
The rapid and accurate reasuring of lamps and testing lamps for their durability were problems of great moment in the early makin of lamps. It was at the factory in Henlo Park that the method of beinging lamps up to a very high inconsessence while they were being exhaucted was first practised.

For several years Mr. Edison gave his principle attention to the development of the Underground system and central

### [PHOTOCOPY]

station appliances. For a chort time he was at the lamp works at Harrison fitting up a laboratory in the upper story. This was just before he built his Orange Laboratory. There are quite a number of note books of this time which show that Mrs. Edison witnessed Ir. Edison's signature in the note books as she was often at the laboratory in Harrison, helping him experiment.

## MUCKERS OF THE EDISON LABORATORY

These records, which cover the period 1902-1909, consist of a minute book and a small amount of unbound material pertaining to the organization known as the Muckers of the Edison Laboratory, Founded in 1902, the Muckers was a select, dues-collecting fraternity of employees at the West Orange laboratory. Its founding members included James B. Ballantine, Cloyd M. Chapman, and John O. Roos. Among the early inducted members were Edward P. Dinan, Frank L. Dyer, George Heatherington, John V. Miller, and Martin A. Rosanoff. The minute book includes a list of members, an account of business meetings, and occasional references to Edison, along with comical reports of periodic "outings" by the club. The unbound material consists primarily of postcards and other correspondence from members and former members. The records are arranged in the following order: (1) Minute Book; and (2) Correspondence. A finding aid for the archival record group is available at the Edison National Historic Site.

#### Minute Book

This minute book contains an account of business meetings of the Muckers of the Edison Laboratory from August 1902 Involung Featurary 1909, along with a sequerally numbered list of members. Next to most of the names is a notation of the movement of the representation of the property of

#### Correspondence

This folder consists primarily of postcards and other correspondence from members and former members of the Muckers of the Edison Laboratory, included are letters by James B. Ballantine and Nils Traaholt, written at the ore milling plant in the Junderland region of Norway, where both men were working in 1905. Other items include bills for dinners, humorous sketches by A. Theo E. Wangemann, and various versions of the organizations' constitution.

# Muckers of the Edison Laboratory Minute Book

This minute book contains an account of business meetings of the Muckers of the Edison Laboratory from August 1902 through February 1909, along with a sequentially numbered list of members. Next to most of the names is a notation of the month and year that the member entered into Edison's employ. Many of the entries indicate the date on which the individual left the laboratory, and a few also include a date of death or resignation. Particularly during the period in which A. Theo E. Wangemann served as secretary (1904-1906), the minutes contain numerous jokes and sketches, along with comical reports of periodic "outings" by the club, usually to dining and drinking establishments in New York City. The minutes are revealing of the work culture at the West Orange laboratory, and there are occasional references to Edison, who joined in one of the club's more sober outings in 1906.

The cover is stamped "Record" and is marked "of Muckers." The spine is marked "Minutes," "Muckers," and "Edison Laboratory Orange, NJ."The book contains 239 numbered pages. Some of the pages are blank; pages 23-24 have been removed from the book. Photographs, postcards, newspaper clippings, and other items have been inserted into the book.





at Edison mines in 1896.

"It Muckers! is the tille to Howard of the Seperimenters in Laghoratory, when we happy frame of mind." Herekers' Therefore was

"Auchers" Herefor was chosen as the title of this association.

MUCKERS OF THE EDISON LABORATORY, ORANGE, N.J. Linutes of the Lucker society Mones & Edison Labor

a meeting of the experimentors of Edien Laboratory was held in the goldbuilding on ang. 24,1302, when it was desiled to form a Muchen Society. J. B. Balletine being the oldest Muchen was exettle Chief and C. Chapman as sicretary protemp. J.O. Ross was duted secretary with effect after his initiation. I+ was decided to initiate 9. Kitherington on the wening of aug. 29 at Highland Fack.

Higheaul Fark taking the title of Muchen by 5.

For make a good invertical and options and bad brukle to find out whether "rabbit" at the Comme was beent or bind; anyway he felt sure that the shiff never had been Horoughly titled.

2nd Initiation meeting. On Sept. 45 Jo. Rors was interted at Kighland Fack, theiry the title of Marken har G.

Bad investment.

Afterwards adjournment to "Come" and Methermyton discovered the lifferences between westering a garden and "westering" stocks.

Initiation meeting. On Sept. 17th K. Kerris was initiated at Music Hot taking title of Muchen My 7.

Blue Jean being the dose. No rabbit at the Comer.

Initiation meeting. On Got. 23 R. Refn. L returned from Europe was initiated at Blancy's Theater, Newark, taking title of Musker 14. The villain in the "Stranglus of Pins ' was duly appreciated. The ampany proceeded to enjoy educative ext and a ylass of been in Brockets, and then went to Market str. to develop love hu O. Rosa.

Social Meeting.

On Get. 30 th Chief Bollantine took the Machens to Weldman's to witness a legshow. I fflower on Merket str. wer

then howard with a visit and fellowing business was transacted.

following business was transacted.

Highbolls.

R. Rafe was elected transmer.

C. Chepman was appointed a selegate to call on Moors Warran

and Cowing in regards their initie-

6ther Highballs.

tion as Muckers. Mr Chapman was also appointed

as a subcommittee of one to draw up Membershipscards and Bylaws. Highbolls and Ramet brittle.

Decision that any good fake be incorporated in the minutes. Chapman has "another one."

more Highbores. Special train to trest brouge at 1.15 a.m., "Phepman & have an excuse, my fort path is constant." (Ross). Herris appeared at the dal, the fellowing woming at line, and said he did not feel sick.

John D. Bors Seen to Neural Thanks.

a meeting of the Muchers was held in the "Bouncy" on Nov. 64. Chief Ballantine in the Chair,

Business meeting.

the other standing.

Muchen W & Chapman reported that he had talked with Warran and Corving in regards their syndicite proposed to take the Muchens

So the motion of Chapman, seemful by Hothermatin it was decided but two separate initiations he made the Muchino to pay help the upensus. The cambilates the other

half. Warren being the oldert to be the first and Wednesday the 11th to be the night of initiation.

Moral by Kethenington Scouled by Kenn and resolute Mit for coming to expenses Said aroning, each humber

have to make an advisament of \$1.25

5th Initiation meeting. meeting was hald for the & mitistion of W. A. Warren as Winchen My 8. The Muchans it former meeting having satisfied their desire for physical beauty had this time chos to analyse the intellectual depths of the Foreador " at Newerk Theater. Chapman approved the tendency of the play but kicked over the gues not kicking high enough. after the play the meeting was adjurned to Ifflind's bangust hele. Numerous "Kulmtashus" and Dogs having been consumed following fransactel. The minutes of all previous meeting were read and approval. Subcommittee Chapman submitted a statel of constitution and hyla Ketherington worse, Ross seconded that officers be elected. Chapman

18 would the amendment scould by Rich that they be elected unaniwouldy. The amendment was resolved. Chapmen reported on Meenterspip.

Mr P. F. Cowing was proposed as a member of the Muchus and

menimoney elected, the time for his initiation to be exted upon later. Due to the Ketheringtons

steeping appearance ( how about the kulubachers) - the meeting was adjourned or 10°C. Will - no sick

On the way home Fredly was public up, ashined of bring detected at that lite home

Morsaceancine John O. Ross Chief Secr. Business westing.
On Nov. 21 a meeting was

held in the brewery , when following business was Fransactil .

The beesum made his report. Cowings initiation was set for Dec. 3 and it Waldman's with Seats

s. much in front of the orchester as possible.
Herris word, Werren seconded

that 25 cents be weathly assessed. The first assessment to be paid on filey Nov 22.

as dimertine was persel. Herris couldn't be hold any longer and the westing adjourned.

Macautine John O. Roos Chief Secr. 6th Initiation methy.
On the evening of Dec. 3th, 1902

a meeting was held for the initiation

21

of P. F. Coming as muchen WY 9.

Remembering Hetherment from profound admiration for Waldeman's it was described to pred it off it that place.

Ketherington was amply rewarded with garge jumps from one of the jude displaying remembable while in hand-long have eyes independently of and other.

The muches being deeply impressed

The markers being keeply impressed by the stroits, had to recorn at Iffends by whomas of days, kulmbadus, coperates and other systems.
Muchan ho 3 Miller immediated for the the first time being present

at a meeting was welloomed to the company in an eloquent speech by chief Ballentine

Well - no rich!

ABBaccauca Jus. Riva The meeting was afformed at look.

26 Social meeting. City and assembled at Little H The absence of Freddy was no regretted, but he had belik exerce. as his pants happened to be at the tay for that Ray The There questo at d. Hung. bing notifiel of the event any in evening dress and do girls. The wine at the dumm was of best make, as Hetherington will probable from Eimer & alment. Numerous Speeches were held at other tables, and the number placed "In the good old immertine" and " Whe Dorley to perfection. proseded to the cafe to enjoy some Tokayon. In the cafe was a la crowd assembled, of different ours and it was soon found out, that are

29 international meeting of escrepe graduates was held at the place. Every known indian werry and other college yells were let off and at last everybody in the place considered himself graduated from at least three colleges and born in a couple of different countrys. There was a general indulgence in time, fromen & song; the nuckers, always taking the intellectual lead kept up the song, and some other people, a scatchman, college chum of Ballentines, and another frenchman with their presents likel our wine. at 12 id. the place was abanhood and after having been liberally treated by traver with sodium salicylate, most of the muches reached Orange the same night.

Macaucine John O. Rom.

30

especially not in gold arrays. Cowin

Social meeting.

32 with highelessed jokes with life, when it was aljourned.

13/3 actantin John O. Ro. Chinf Secr.

0 -

34 tollow. From Rent the muchus proceeds to garriego to study the fair soc; the murch contingent of the rune-

hers being especially institut. Same see however showing a plentiful lack of presence, the musters dishihave any show for their money.

On the way home the secretary always interest in financial health visited the Haymertest. Although there were plenty of typs and good

turns in the muchet, he dight fink any stock suitable for investmentsurpose and surprised the muches by his cells recognized

by his cuty reappearance. The muchus hearthat the pier before the ferry had left.

John O. Ross Seem 8th Initiationmeeting.
On the 15 of June 1903 a meeting was held for the initiation of Ma

Frank Dyen to not a muchen in the higher meaning of the word, just a patent legger, his eligibility to

a muchus had been questioned but werestheless being held in very high exteem by the muchus, they considered

him withy of every encouragement and he had been elected a member of their society taking the title of number no 11.

The meeting took place at Median Square Jules, where bandments. Dars presented Venice of italian outinities, and a concertband both

the best in the world.
The meeting was very pleasant,

much to the chedit and dhit of Mr Dyen. He likes matching middle and betting. He is a very sine and

-- 1

Whilattronic man indeal. The muckers enjoyed minersly the music, some numbers of rehich were the most classic in the world. Chapman and the new mucker were expecially interested in the finale of the Valhage but we have forgetten, which of them lost the let. The wine and the andwickes were of excellent quality, the coversandwich could even not be duplicated Warren highly thought of by the muches for his bright ideas put up a bottle of most & Chandon White seel. The weather not being mustin for an automobile drive the muchels had to leave the place in cabo, and after an excursionstrip on the Hudson reached the most picturque city of Hobsken. Here the meeting was contured, the chiefmucker Chepmen greating the new muchus welcome

and hidding ferewell to blucken ithinists. Chipman was tracted, this meeting the first one with him as chief the meeting algorithm of 12 w. x.

John O. Ross Secr.

-1

38 Soul meeting. On May 9, 1903, a social meet was held at which were present Mr trank Dyer and Mucher's Harris and Cruing The meeting took place at Hergeseus Cirkus, by many people considered the greatest in the world. Before the beginning of the great show, a number of Sidestows were visithe quelity of the show cannot be expressed in intelligible crylish but we appreciate the foreight of the management because we noticed that when the great show was over all the sideshows were removed and packed in. The crowd might have been less goodnatured, and three underwriters don't take cirkuses. at Ketrenjemmer, however, we found consolution in dark importal Wer Dyen this being his first o

40 12-4 Initiation meeting. with the muchus, was greatly pleased. John O. Ross On July 13, 1903 a meeting was held for the interstion of Mr M. A. Rosanoff who took the little of Muchen No 12! the country for some time, he used the occasion to bid the nucleus good to as questo were presente Mosers ! Salmond and Keith prominent alchemists from australia, at the time biles. The meeting took place at Palit's and the place gave full satisfaction The music was ploasant and executed by a lady orchestin: Wer Salword was very much interested in the nursic Mr Salumed did not drink any wine to Chapmans disappointment they are going to have a two months after dimer eloquent speeches were delivered for the new muchen

for the questo, for the old nunchers and for those who were not quests. The time of the trains being in accordance with the secretary's watch, they were successfully missel Wer Salume went to his hoter of We Keith's later whereabouts we are not certain, on account of certain perfumed letter we got knowledge of. The muchus half to take trolley from Hoboken and reached Newerk it 2.30 a.m. There they enjoyed a stop of 1/2 hour. Chapman struck up acquintance with a dog of local breed! They got wery ohummy friends and chapmen decided to treat his now acquaintance to a prese of meet. The commodity was acquired in a wearley open-all-night restaurant but although chipen displayed most persistently refused to touch the meat. He probably recognised in it a prot of some dein relative and withdraw

hattle. Chapman got augu our this St. importable believes land thou away the meet, numming something about to the days.
We think his remark was only party consistent with the fact.

Often having connected a trolly its sleeping can, the markers safely resided with language.

John O. Roos

1

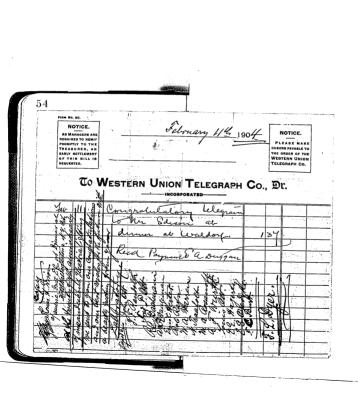
Business Meeting . On Jan. 18, 1904, a meeting was held in Hu. Byer's swell private office, The nuckers, with The Exception of Mr. Dyer, being comportably situated on the floors It has been personed that for. Wangemann aw The Goldswaite The writed to join The Muckers, and How the question was raised as a whether they should come in as receitly innunctated or as of Muchers, in view of Their former Connection with the Caboratory The devition was reached that They shows come in , Mr. Wangeram as Mucker No. 13 , Mr. Goldswart as Mucher no. 14. Mr. Ayer Then mound that The point of the constitution regulating the election of the Chief Sunches

46 be awarded, The principle of huronly or Membership not being manuarily concluctor to the Dociety welfan. The Warren Remado the motion, and it was decided to call a opecial melin for the purpose of discussing to but jest and electing a new Chief Mucker on the mans principle. The meeting was then adjourned. M. A. Rosaway See y

49 Breiness Meeting. On Jan. 18, 1904, Exactly 32 seconds after the adjournment The twevious meeting, a new theeting was held, my Muchers being stile on the flow ( literally The accordances of the Constitution goo previously suggested by the Syen was discussed with great heat, and it was decised to leave to choice of the Chief entires or the actualion of the Muckers them - selves , It was further deemed that The Chief I letter of Office should lestingia axteris over a perior y on Tear the Election being bet Which amendment by was adopted unanimo Me Rafu was aleeted Chof Much for the Courses year. The heading was aljourned.

50 Social meeting On Sch. 23, 1904, a social meeting was held. Among there prosent was Tw. J. S. Jones, a friend of The. wangamamis. Muckers Ayer and Goldswaite were absent. The Youling was hed in the Mirate diving room adjoining the Kitchen of a poelie little in on in be drang Valley (1). toules of Texcellent Swadist Punch, to the Consumption of which The maching was mainey devotal. But, as, after The " coo of The sevente bottle it became apparech That further indulgens might be dangerously stimulating, in their Votusting to 8th boile to the can of the Francis St was dierus o sens 4 Dr. Roos, by mail, any The

Empty bottles , enclosing a - of the ling . cigar & elips written during it It wants be usiless or attemp A devoite the details of the even The number 2 Skaals (pro skull) in honor of Dr. Rood was Exceeded only by the member of with pictures drawn by m. Wangkuann ; Postal Cards were rent to all The abrent members of the Joriety. The society was the divided into two sections, our Poing hour on foot, suring was to Trolley. The other peacefully taking I was deeres sometime soon Thord a business meeting for The purpose of de Douring an Extension of the society to withde all of the Edison of personnets of famuer Theres.



On feb, 27th 1904 a business meesting was teld in the byers office. Minutes pour real x approved. but laid over for future countries was the last meeting this was the last meeting bu Moracoff as secretary. On Jebr 11th there was seen des Edison a telego to the Haldo Electric litting. He O. attacker to page 54

56 I business neceding was helv Death 1904 Bholdangenam was elected benetary occupation from notes a a blower Carl viz \$1026 Motion by Mr. Harren: all pay meetly dues to leby 23th 1904. au renews payments of weekly quarter on November 1th -Carried. half an outing . -Moved & carried to go to Salest 120 th At 8th Rive In M. Cit on Thursday Dec 8804 Starte an 618 Hair an D. L. W. R. Edward Dinau was dul Meeted a member. # 14. moveta carriet tim Mr. Mason & Mr. Haus Meeting on Dec 82



The Music (Italian bant of 40) was Thursday Dec 8 12 exquisate - On request of Cowing the Lignor Harco Vessella Dicetor Extra Hearts & flowers was played to Olives and the sidemender 1. Westing March Laves Dream after Kepall was rudel 2. albin leaf Wagner disturbed by \_ a coextail\_ 3. Ouverture Maitha Laton The Oyster marched down - "Eigh t. Love Francapi Re Ball Ce Bulling 5 Ales Ao- Jeyen Leubers 6 Chor frankbubarti Terli little redelaces to the str the westingwarch. dishes flopped & sured like Woodland Laders album leaves. (see program Bet. Carmen The strain of "Co-la-la loprano delectro Came Spiritualistically Evet x peasant Ouver 10. Chieken Souls, Whose Vo-la-la the standy of a friend 12. Loprano \_ 13. In a Casey Corner Bratton player, as the Jodling 14. Blue Danne Arrasis "in a Cosed corner 15 March Kesaclea. decreamy the deur woken present talker laughet & joked & want?

Restaurate Restaurate

63 A read silence came over the assembly when to our request (starter by Erachold) the band played the Lucia Vextet perbly executor le instruments, player, perfect, that the Brass mas During the Evening the Seles. Freeter by motions a Chapman & Wange Fallet Finner programs portals Dr Ross thrughe in China, & to Wison respectively. (Reone on page 62 was received on Dec 9th) The regret around, They are duly answer by the Secs. combresign by the Ole as was also a letter to the balland The jokes of the few was reasonably lit up by ha raising the beautifule re perobables to secured those prese



65 Esson Huckers should see their till-and-mend their mayo Chapman told of unlack Kausen of Hairgillo (Harro & when lule & quiet reign Chapman woke up to strain Taust March - all bollowing because, a hantabure la hassing our table & au Water was only once al Their Palas Milioauske exclaimed, that : = " When the this other - they have a Lattle from Chapman a Court

66 in which there figured a Judge lawyers - one Dog - one chin was so difficult to Estar that the Julye ask for a in short for the page call. The intrepreter well for through jaw cular gypu Sound - Heil Ms Johnie replied feriously & Earneste for 3 minutes 10 point 3 459 Chaving counts 134 fr the cirling) nearly callages from impationes the hite pretor loved low & said! It was a Yellow Dog your

68 69 a number of Labratory jokes bassed the line out for gra Que of the first Thous jokes An Docale & 2 ladies " send by the ? in 1888 to room 13. to hear some musical records were showing by Halt # miller - who ou peque of one lady for some feine voices) ask Marigania he Kept Done of Effic Atter Records (then called Homogra Thown a certain lox with a mixed content, he lacked at 200 one for industations & then toging 3 it he found them with clarinetto of Comel etc. picking up another one he tell seeme from its lacks to a larie's boice picking it up & holdies it to his ole fact

another one; 71. a Strause came to the Edison of tall him his battery was to good it was cheap etc. Mr Evipan = Why 2 Stranger = It only charges a higher One of the assistands rewarks about the Fe (fee) (ferum) charge - & its Elisan said Hen also one about Fred Oths 5016000 Tools and the one tool created for the most perfect makacifon Ca hunal being and a murler of others Chapman & miller recites of A chear from arizone in after 16 Salvous were visited before gain to the Ceasing



We left Palest Horlen at 11 4 7 without accident except Willes & Chapman got converient lost in the woods of greater lews Lown 9th Que To we Spel. To mickewerpit lead 1 Men fine of the Eight took their weight Rafu 155 for Indaholf 164 - 155 . Wacyana 266 - 228. Hausey 152. Warren 166. One casily sees, that, the d'Herence hetwen Hausen'x is 3 panuts - Warren & Frace X Hausen being the lighter the drapped of in Newan a Bloomfiel cam While we other tried \* Cato in Maier's

e step as a recognition allow " Ship was carried & Kafu resigned as Chief limit of \$ 1000 was appointed a Con resignation was becapted for of one to look for a place in & Thiller was Elleto the Newark to hold a farewells Chief Mucker for one year (1905) to the outgoing Chief Naugeman - (Secretary) Trachold The secretary buying of (Treasurer) were reelected for 1905. Mucker Stamp: The minutes were approved MUCKERS up to date. mation by Dyer OF THE EDISON LATORATORY. the compliment the Jease tany CPANGT, N. J. was carried. For One Dollar was approved the proposition for a plung Proposal's for the next Muckers badge was faid over meeting well for the next meeding. To admit Mr. Hausen # 15. 4 So change the dues to One was appointed a louwitte Dollar key month to relieve & One to look after a suitable limplify the Tocasurers assent Sudies! present for Chapmian on kkroves marries at-0/- minus of Jacuary find 1900 ver's motion & OF THE EDISON LABORATORY the treasury for such a ORANGE, N. J.

78 Secretary Rotes of Events. 7.9A complimentary letter was send to the treasurer was ordered to receive Rafu an the accasion of his leaving Surplus hond, (beyond just dues) a for Europe Jan. 4th 1905 prigned by all his to lurbory the Same outs his A letter was send to Phageman strong box as properly x duly occasion of his besting Jan. 1el belonging to Muchero Gund! Makeur Kjos Hausel mas Elected Copies of both the above are in the aselis A latter was sent to the Ch. A. Fisher fastlong a member of the Huckers the alie father-in-law of Chapman acknowing to casting on motion a single Ballon Red Jan gh Cari from Roos & letter from Kin Chan Question of Mucker barge was laid on Duly answered thoulatter. He question of admitting theres N. # miller aylesworth Randolf On January 13th the First business Bachman Fred Oll. Wiles & Kasa Meeting in 1905. Was called by was laid over to be taken up at a fee the reto Chief in prom XIII. meeding with the Exception Rox Milles Present: Willer, Wangemann, Trasport was instructed to comminicate or \* Warren !- The himutes were ready alieig ast - the fearetary to sauce in regar approved - The freasures reports to To Walt. to miller he keld no his Chadriak notes but 2 3 Our Outing was noted to be till an selv 11th in Cafe Boulevaid 1.9.04, in Lowor of the Edisons birthtey Hollars cash in His strong Box. the change of dues to \$ 100 ker Mouth were adapted x a motion (by Mana) It was laid before the mucker unauinously carried that no to be considered at a future Met: Mucher was limited to \$100 per to Heet mr Romas & Edison only x no Mucher need by strangy Honorares Chief muster al \$ 200 po

80 The Chief & the Secretary was noted a The treasures reported for nineroscapio Commistee to lay before the Musken Aleujuation of the strong box no a scriped Iraft of Constitution of New microbes & bacteria had kye laws embodying all changes is recorded - also to give pomes to the developed not appeared in its interior & the "ducts" of With decretary & Treasures to red in the intestines were realy to be fei obsence of the Chief Walter & Hiller was elected as Mexices was then to sources # 16. Ralf Asbogant was Seely MUCKERS Jan 1441904 as Kucker# 17. EDISON LABORATORY On proposal & after discussion it was voted to change the Cousting tution so as to drop the blow of heroly electer members & sub. Stitute an initiation fee of \$2 nestanj Notes of Events the monthly fee's of membership dan . 18 th a letter was see from Har to start on the I dof the mouth accepting membership \$ 15. Receipt any after auresp. Eleation Jan 20 the Mine Kers were bots find Chief miller was authorized to found & find out the agles worth vinces Meching regaring joining the Mesoker held an sets toll in po Extantion of meintership to present Miller Vaciousan Trasloto a few old Theployees of the Estin Warren Dinan Lansen. Laboratory who are not strie The nimites were read & aproved. muckers was discussed

82 no action taken, until the see him well & sound at his Subcommittee of Chief & Secret all post quiving & directile has laid the new Draft for a the progress of the Laborate Constitution before the Case Jef 14 1905. \* they had been boted upon approved. It was poter to leave on the 557 D. L. Hain for a Joel Simer outing in the Doubson Secret's : notes of Events capi sea 11 1905. Partal carto for Dinner were 2 Secretarys comments: the Alut to the Isthuckers in the U.S. · meeting was an actif one Fel 8th ale Portal from Gapenan & good Sat in & the general interest taken Felo 11 the decretary send to to, Edison by all Murchers present seems to bake well for the authors a boutoninière (White & crimson poses of a letter " hy dear to Edizon: of the mucker fooisty in the Speedy heavery, good Health, spraces and Coming year a long life are the wishes for you on this lay ; We how cheerfully Know that the recovery of The makers of the Expan Laboratory V. Lear Jebr 12. a letter of regret of necessary I likan after an serious absence from duting mas received paration performed an from aborgast. Febr 13. Masker # 13 celebrates the gressing very yatisfectorie. 50 th aniversary of seeing "DAYligh &, we all that rejoice to

Outing February 11th 1905. well - what not ! it left he N' obsective Cafe Boulevail was Experimento Elsewhere! an reached at youl - Resent Chin when heart at great distances Miller Tranholt Warren Hauser inderwoven with the merry 2 lowing Dinan, Chapman. of laughing New Yorkesses Wheelerctary was inavoidable absorg Simular of merry jesters, leaves that Essatisfaction of me. The crush of Saturday Ide Bolemin was to great to beruit a table sea. successfull Experiments which the Orchestra, so (as Housen puts all we Muckey fearing at times it ) we got a back seat in a bearing Chapmans Stories & back menos Tha quessing contest about the ries Inlived our table & made a Jastuers of the Music thrown in !! for fet the crowded aspect of the He first toast complimented to Houlevast & in due Time 90 Chapmans generality to give to the Muckeys left for newer quators Tusband the first locuing off since The usual greekings were sent to Jamaiy one. O. 5. Then the Our absent brothers in them. Alw Chief was toaster- who Off "for ours! Ortherm - Sans responded in Krit It Chandons Though x other castern director west to the beaver of the name received visito from us - Hery we all loyally revere a since where sucko, sucke - snoke = a long & prosperous life A the mixture of which flavors Thamks of Thisan ! where burree Heldinan 58 & bistholay falls on this - Warren Combination, even day - the Smuer its self? exackt that it reat is good

86 Harren especially who as an all Hos Nore eyes ( tabaces being leath an the Marks aspilos Jone & is very autiception a navertie thingut cheerfull his irish beer trishless Que of the best penceties against so, & with great window (based this eye soming smake is to turn parti pelfixheess) Tralell took ones back to it & fread stones up the filler of the good whips of Manhattan & breeze the Mucherix steered Her safel o Low of few forks gutters, and Rash the alhambra Missons Fralley along somewhere else! & other joints with suclows This we his & the next half way there to explain the aestetic house was down sharkey's 14/4 question what becomes of Street Imporium\_ Com Share "Bear'! Is it brenk as con Las Vicagnetia fixto and. sumer's imbibed or slow his grip is as the facuel as gravitated indo the lower regin Al touch Morale Elletria shock Well - the general consent Just ask Sinan - tollte was easily obtainable that: us = Jee - What a fish that Dur woothy Treasurer is an fellow's got!!! His square Hinbribing Consumer who whe Makes for one feels all aloff at times gravitation by per " & slowly one primply lato" mitting "the neglect of lower Aim grip, while ares check regions in favorfan eas "X chaulters fail uppraists!" Sented winth - viz: beer & the Vailor enjoys to give appearantly down by that sensation x fairsen Glass full it really but los Dinaire Witnesses theretoo! dio tonque & acimater tio

88 Spirit & unagination! ofthe twinkling eye of paid gentle in short : The beer ( the schore brightens when telling of a Newark Tio palate! "Counter motion solopy " Brewer buying 156,000 to At an respectable hour me in Europe for because 2 for ben Send our clased Chapman He 'll kut me jut beer barrels an Gack to Branklying but it then - just waits! & waits! & is understood that while we waits! for foon, he Knows, he are willing to so go in the Las hapes all over !!! first year of his married. But personned Dinan life, we reserve the privelage Brickehurch for Yours! Keeping him out later West of Crange for Ours or earlier hours in time to come if we got to wait & see 5 or 6 Sman a propos of afore mentioned Que car's go by ! it's entertain Thankolds argument, it seems for, for our today Jel 12th is self evident that a swallow Finestico bishlay & all good is not a " Drink " lint a bird! patrioto should feel delighted and a continued flow is at anything basing the Mats not a "cousume" but the Martyr's above - there are 364 filling a tank! and no dails in the yearthwere the sign wonder that on the ferry Sincoln Que car makes our goutteman should exclaim blood boile till near the "Don't walk all over me do rather give you by feat and when quick to pestored. Chief MuckeyORANGE, Moretan

I Duriners Meeting was held. unidiation fee turned over to room XIII on Yarch 8th 1905. Fender "mercy! ( The! MORE BEER! Thesent: Chief Miller Leer Vaugeman Mr. Aylaworth was Elected as mucker Juan Tracholdt, Warren, Fransen # 18. \_ On proposal for new The search's notes & report on Outing This Members Mr. Whiting . al Weesth ain were pead & aproved - The report of the terson were ordered by the Chief to Treasurer was tense, short & pointedly be sounded by Trachold, Wange given after interse & hard work in Balancing box to in Eight work: & Dinan respectifly as to intentions: Mr Warren discovered on a con venient stop over in New York a Seven or eight Dollars! -! The Boleman joint in the Halian amazement of four muchers appear Restaurant of Gonfarones, corner, theuselves in an admining sileuse. Medougal & 8th & after discussion The fifth ( Warren) shouter and all the it was voted to hold there an Outing 150 tin lovus in this prom peribrates on Karch 24th \_ his voice: "Hurrah! Fine for an ading Unofficially it was unverstood that Which really in effort beened but Each Mucker should notify Mr Dyer de 62 1/2 per cent of the worts of our perately & indusionally: that; the legal believet quarkour of Stronglog desecto Status of our posicity, with never in but which in Every contracted to our better consistion than at pres Treasurers quiet & reposefull voice lies be need not be afraid of work a 2621/2 percent effort - Tressurer our next Outing, but he sloues feeling that sting a led still more Consider that individually, each reposefull: this institutes the first member would appreciate go

I he could attend & let us profit Octing March 24 1905. Tack about by his suptile wit during our the weather! It was not a circumstant outing, our eyes fearting the to the smile of the "J. H. N. "Trio Trela. same since on the genial sais in Leavy Senahing fain & in his countenances to 8 4 4. unbella less greating the Le aproved at the door of Pour aroue's : Kas any and Se Miller 1401 shown up 26 Well no? The are for way, a regular histen, universe clover clas! Que insite the wou ecretary notes of Events the trio mare trughtenedby a few door Hard 9. Rec a letter from #17 regaring nation, Labora of augustura bitters, mixed with \* 9 A proposal to admir all Muckers juice & an olive on the side as a muser some title or living which chaser. Rp comes # 12, now signified Avould cover Muches previously at Labore Profeso, at the Naw to Mainereity organia to 1902 was made to the Scoretary! Chemistry This time auswering the here 10 Socials of arting hand It sent to all about M's Querry How's Ex lette babie vas "very 20 Recl Letter from Houry Stanis pursus unprofessorlike with laconic raine 22 Suggestion to pass a revolution to of Exelist & chin: "Thick one!" The when the privilege of searing of part Rasanoffs are prolifice indeed & minutes to exmerges who visit vary their outputs for this fix the Caloratory or are present at an Outry we were tall its a By 23 Had visit from It S. a. Blan Jost Bichman Mexit came "The Man with a bundle" And slower an Expuneder of the lat the mas a good ald "Chap" - & Elick neat & here in 1888 - 91 onthe Sof Fermelly well groomed our prospective # 19.1/2

94 95 Neurila Whiting who asked the greating x swiss "Liceolos" who as first course whalf parition of between set before us a hornegian vassine or rather standing & sitting : gentlen 3/4 of a partine & 1/16 of a Elemon Pach an a Can we have what I mant to 202 very small plate, the balance of the Barrine Fory one smiled # result: a repeate was broken off, as it would have lapper cook-tail !!) We were grouped over an the frim of theplate) the darvine Crosses Rosants Chapun went down without any accident, querry & stories passed back & forth. in a momentary filmae # 12 Amiled still Chewing moustache Lair (and Parisues!) Belloin Journal over to Chapman & Rosanoff " Pretty good lies " # 8 - it's all by Who marked their interest is # 10 .= "Salt it down". Mile 2. 12 x Chap by chewing his fingertipes prospectif 19. was reading the extraoning Rasanoff american faculty of producing: mitre out of a lyproduct of a the very milia manufactured steadily in rippling Afreams by Mothers, sweetheasts vice \* palices to help along the Cause Tobiet is his favorite nuconice on Surgency of internal fight occupation when hucking out the pro which made the whale gration & blematic statusas presentin to four years in Union & Rebelli themselves as fine rolls at the Same Fine - While I sain A Bohemian Simes in an Halian resta The # 2 passed to the other unoders would be incomplete without french waite an Inlaised Vamoan Stoto Consp

96 that the bassan et. Thotographers A.M. Sularge but he looked dequated when flower "Amything" 5 for \$ 100 #2 got as by mathematical calculation further, for the query stouch him tumb that by Sept 1st of the jucrease Queso I'll pertromise m, 8 gol a falice Keeps up in the same partie to a Samly Cary & I can't get Sulary he would look like 229 lbs. anduto cheaper than that! 198,#12 To which warren trying to enjoy eiga again reflectively talked about his rethe smoke longingly intervened; bye " while the orchestra played don's Un I wruses if they'll chucke me ouit = do it free !! - Up came the one suloked a sipe! Customary claret a some one acted Fish (ohad!) next & everyone I wonder if this is 8 per cent! processfully got not cloked by a first # 13 voiced ! Jes! 8 % clavet, the real bone - Miro Chapman's health las. 's something Else! - next soup. been dound in red into he Chapen & the party grouped charmed all present by a hussage ## 10 x 12 exchanging confidences saying: Mos C. Atas wishes you to let a late near April 15 l'orlere & # proof. 19 listening to our fearnes & carners When you all can come to the # 15 x # 13 mixing his your to Christening! to 528 Hattush Que get the soap x police oil taste of Brighten heart (bridge) train to Boop place station his claim chowder soup! one lock to left, I down to left oflights up all present on paupoling pero by christening he explained, Mada to be a Juaceso. Chaping to be auxious: What he said when remarking o the " pritches " given them by the Men gain Dotto Juce my marriage & the Muckers to Catch its Contents.

98 Universally accepted & it was motioned, seconded & carried Mickin ly vote 6 to 1 (Chapman disconting That koins of ditre & auce & all other should be left home: Trackall proposed full Jury Warren chimmed in but don't tur full. # 13. Of your loes he's outa full tarn -Seriously a suggestion was week botanical dictionnary! to put in by laws that the chairma Roart chieken & salad at an outing at will flower order good & we now injugad a any two present to change feats Freat of munbelless stories, joke in order to give opportunity of X questales a few of which He how present of Jamuakers to have there record! - Joke # 1. Pelicians little heart-to-heart stalls The usual, customary Camoutable "- How do one Spaghette 2 Status x amission, for ouse black and Warren procested! This was on white for once attachable to be all or this was put in strong box as a homble example was served on is. It read : Very somy can't be with (Lecond line) You towight sud bed roger First line) to all Frank a. Dye You may not think that fung or achetting

100 but just read the three lines by pollinging us telegraphic hof all Sistinate, separate & you get # 2. Mr Edisons story of an set telegraph first line = that Dyer each be will aparatar, a crack-a-jack at that named Dagart he got to be without = the was!!! who mas working with Cartral &U. R. P. Co Second line we do : me div! que mas had to best but hat had talit of send Eleven postal cards one Each aronking + days than he would for Adays to Each absent ducker & sumaker be a regular Hoho & get Brunk. Had been mostly facting too! We swear to it on x off the Road innumeral time bearine every head of digned them a " accorted Manager for a Job. Who said: No we know, we sit the forme! we can't put you on again! - of give Thirdline is mutoultedly a slight me one more frial - No !- Justane the operators musication, as over more! - No Becaut! - Lay Cling generally is a motal of moresty I can get the job in Cairo, give mie & circumspection, dus, not as a pass there x I'll be O.K - No can't He telegram seems to have it general to "common that To any thing for you - but a pass you hothing x you knowed am never mind Dyes, we all were a first class operator a in Cairo is my job glad to have you remember us a-waising - No soc can't do any thing I he fla'y was advised to thank for you - Will then gi' me a timeter you for the spirit of your pristantion At that & can dadge you soul traises and to conveye Our appreciation the # 3. Warne Bagastus when gaines with the distinct proviso that with go a Folo well to home & next outing non'll be not the lails here, There, everywhere - Ouce because Solution that you'll be there! to a small station broke & getting & not ruly as delusion & a suais. to tack with the operator ultimates

102 acked him for a couple of rollar of words are concerned & the world Exerator said . Janis Mion you but mechanically letter after letter Bogastur - let are have the Keyof over after works Que begarator telegr instrument & I show you see received important news in a tele along the line who I am - No -! for himself. He went through the can't even then give you six, lou's regular portine, fealed & alread Know you, never than of you! -Invelope - it was full to his house Bag! never Heard of me? face the & he found it there when he came to Ais supper in his own handwriting # 4. Evision Law might thigh. Bag Day Aly to his non great extensiblement! One night Deeme in full as a dioth 76. When in Cincinati Fixon picked up on axchante, parashed the received the works over the wire the stove fipe, Knock in the love, peles Sincoln was assassinated. Prica Jown pritalhoad & Jamobished got bates forested it as afressed & instrumento - When Strongs he received the news in the regular went into fall emploant x excessed way by hewspaper extra x when the batteries & went out It son in the telegrate Office they lasked up fixed few wires to operate with & who received the news & rid not speed reporter in the morning to manager it among the Operators - the work He lasket all a - Elank for few were in Theon fautwriting. mon cuto & then said, If Bagaches # 7. a man tad an immense appetite does that again - by fore &'ll & low a certain Day & ach week his orscharge fin ? col man cook had 2 chiekens for his 7 5. In Evison after told that the Finner. One fine Day the Maste perators in # fine bee found only one on the table mere machines as far as mean to called the cook where is the office

104 g always eat one & part faut. that monnment like a cisc for went down & said . Where are where is the office ? - Cook : that is The other - I have caten the first! you going Frofessor? - he said # 8. By # 12. Thoferen was stanking -! I am going to my leating on a spring hoard over a lake x 1/2 halfe four earlier! !! watching & counting the rings in \$10. Inof Starler Specit vaccation crates from doupped stone to go a in Landan & When back in 1.4 Mines certain retaine le got interester Te was gaing to explain to student x on the obs 6th doop the doopped his some point or another ... When water instead of the State lecturing the last hoise would #9. Frof Sylvestes of Asphino was as make him stap & scowlast the a lovor asked to give his leature Bistarles - the began the furters at 845 instead of 9 15 AM to accour. " When I was in - in the Take a collegue who manter to take insane graylum - Bing! a certain frain - Aglocates las down fell a look on the floor a routine to a minute & Hat Inaf- seowls - a wice called moning everything was 1/2 hour mil: Whofet you out 2 2 earlie's - te got madder & madder N.B # 8. 9. x 10 / inquarrantied frue by #12. & when on his may to pollage his augur # 11. a visitor watched in Insure aug increases every step. On front the excersise of injunates whellarrow of the hirverity there is a some some light, some, heavy loads one momement in a small pass haw wheelbarrow upsite down the with circular park around The watched the latter fellow stopp out monument. The Students from of line frequently & when all tad the window saw him go around made Troums the latter had made 6.

106 to stepped up & asked what is specking along a bace entered her so that for & the auser los a pullman tomiffing around m' m' m' me 2 Jam erazy! gost or sweet things and every & when I put the barrow pight sind climed justo a beath of Sissappeau up - they'll fill it with bricks. Laterly the Frain stacked up en me! & SEE!! Sh- sh- pl !, munchingly licking his ah # 12 (Frue Story Chapman!) a runker left the train white near the man asleep in Frolley would are birth could grungingly be heard simily paine his arm & hand, his the work of you were a gentleen conductions would stop the care you'd have taken off your automisheller call the street of the Brushast Lax \$ 13 listening to this story & wants his hear - that dappened 3 rything to wash down the taste of he -of the drish conscioner stepped up gongazola butter sall pepper x to the man & said : That that Clared Combination took the sed in so yet want? he man said bottle & filled his - " Cup" instead What streight (Whiskey) have glass. - The freasurer # 10 has Zun gat ! long Reen giggeling in tis kants # 13. Chapman Las been sitting in bockets What may have been eithe Telp thought, his eyes looking in thing Keys or each - & Lept on Parilies blank space, but now came becy La greene for to - x bedel laster the medical for the whole sacres & property the musicians & property to Earth x said I had a good jake in mind to tell next, but since my marriage I last my mount? (Indeed a changed man!) buth Freats figured only \$ 340 get are " had do fine & consal a time as continued. Here's author. Ever for 5 terms (or less) the account Ravelling in the Will, Wasley at last # 15 was leave from:

Joke # 14 Cuiltask Ma Olive ail need in cooking at A I look like papa, ma? Man goufarous gave bythe afterlaste Don't know, buly met him or the pightuane at a basket hale party !! lent Orange was reached by the Come to think fit some one flac anartett at 12 22 after Haus fold that loke, to getting appearant Lad calmed down from listen a glimpse of a possibility of to inacherent remarks of Catching Chapman's loss of memory the Verestary stops right Souther man back of us sleep in a feat who winking are eye would think aloud in german Leve telling all further jakes We remembered all about they were recontellicible Muckey x left about 1115 PIZ to Warren but hiprotiped change in a splasting pain & broke On the whole the Evening a up to go each our offerent may. The advantills of the on his way home will never be not have been more enjoyable approved MUOKEAS EDISON LABORAT OHANGE, N. J. told! Rodanoff probably chewd his left monstacke all the wa 7 Miller done, Juilige nocital x laste to his wife, never stapped ere Toerstary's hotes of Events When her disset his garing Spril 4. Muslew 19 x 20 wese rot X dy & only stopped of Keir Election Mrof Chas Fines when boiling entale max & stearie acid with wing Mid 8th Lether from Chap. ero of all sort of oils - I support 

110 Business Meeting was held in room XIII on april 6. Chief, Learctary, Treasurer & Faux Dyer concurring in all delilerate The minutes were read up to page 109. The treasurer reports carl \$ 800 not including the Deling Decretaries hotes of ivento ( thank is not paid up !) lacking over April 12 Received Chaplo letter app the brim of his glasses at the Empty Mr. Vhriting was Elected as 4619. Minasters: associate Muckers As Weeth as No 20. April 14 Received letter from \$5. (Ketheins The thinking caps of the Musky Were set into motion do think April 15 #! He Secretar, France up a name for former Musters Marshe Cowing & Hausen enjage Facace previous to 1902, who may join on it's & this Chapman & July ch Our association The Stateder in a Lemonade Fruit Be The request to Lave at outing . The doctor prescription of Before & seats changet accassioney as ordered by the Chairman of Carrier to gently by the content to were not peglecters the Sveines mostly pronounced a Success. MUCKERS April 15 - was set for the 20 to visit Chapman's better halfy to christen the Ditcher

All will join in wishes 2013 Business Meeding Kay 16th 1905 in Lusther progress in life! Success room XIII. Present Veerstan Freas x good Redeth may be fis!! Harren, Fansen aybeworth. On motion of Treasures the dear Lyer, J. V. Killer . Wall. Milla Witing & May was Heater auditor of his Asong! Concurring in object of meeting. hox-accounts to receive ale Dinau & arbagast absent Documento etc. Sending the Leer. report adopter Letters of Weful hetern of Chief Willer How Cause Aetherington read. Whiting & Wangemann ware of Treasurer reporter \$130 caled & without a Committee to pelecta suited standing duest 3100 in Hong box! momento Marien partit momentura algeron of Siebert was Electer as for Frankalth (inside of from 7 to \$10 #121. Mucker Hausen / who will leave in an Outing is to be heldad tales 1012 beeks! to receive a presentale 126 H. Frislay May 19th at 430 PM to be four 3 to \$ 500 & bother Speasurer Transott in wellehore words reported his fadness to be ford have far fesolution, sign all makers. to lay down The Office of thousand as his mothermeded him hours. In the would leave for Morway an May 24 130.5. The Muckers loose thus their Lecretary's Note of Events. May 17 the secretary Subm first freasurer, who by wery One respected & highly estacue Edison the fact that Tracket lovals value highly for him to head the less of muckers & to Erin Subjected \$50 will be his so as a practice forein

114 Moustacke change Stofesto 5 May 19th 1905 's Outing to Valor Propped in to say sweet Whisper Starter for force at 8 del, others at 710 to Trachold & Mausen & to confile but for our flick & well grown that his garrule "was sick out Receiving representation the few 33 Se coult stay but a minute, when Commence in the Guale tree Lours seater Thos I for ou Lour. We pe As a shopper or discount Knooker membered all absent mickeys he has his initials thell chosen = & EX!-es by the usual portal Cash vix. = A-H-W! the Leas & the went The Evening was a Thouraughly the limit & on Fauseu's brush enjayable one for every one present ( silver mounter by Jorham) the initial " Both to be Exmunckers" laugher & x on Trachold's mug ( silver roker to their hearts content after loving Cup- Front for autimeption an excellent meal for Desert & 19 shaving cup or a post nuptice produced a parcel orhich facules milk holder for a prospectif first bom with appropriate brown to the outer also from Porhau Mile (6) a suitable Treasur was by him opened in scription (\$400) will be done free contained - for thin and for of charge! Will \_ in pite alle Farmen 3 Each Valentaugen cocktails were in order and que Salded bread rolls as taken with dually we settles down to take heer in Dutak postauranto. Off Dollar dinner Sauce Spok as the Coffee the Secretary addresses per page 59 - only Trashello pla both for F. & presented Then shade had been removed. the marriento of our present: Secretary, Francus, Hause Transold - a pilver loving this! Navreu, Whiting & Carriers. Du Hausen - a Silver topped brush.

116 hot fuitable engraved by and in happy whilling add . The Johnain Infin Co Land her the Louis File 1120 F.H conclude is were the inverported happan the Muner. 12 o'cl Del Lack to Hausen the taciture the kirty Brickchuch & a parting Drink waxed elaquent in praire of k to the health & Welface by Laboratory by Edicon & A. E. avorth. Se payed the highest tring pasting friends Next day As Paulolph shows to his indefatigable energy & latter to As Evision who smiled persistence - to his reserche's & felt pleaser reading it Thories his kower of deduction - his over. So Trachold he reman great memory & his modest Why lonk you get all the former easy way with the men sired Muskers to Soin You employer & Ingages with him would have an absociation Hausen combared him as (& invitating the furother second to none living Tuna gloves on two fringers court in styling qualities tuck as box 7 of theus die Brillionais were necessary for his look & Sauveco! -- Thy don't you gro. Fis greatures of perception Traslock goes to Norway & his happy demperament Forsen to the burkert to - Ste lete, ble feeratary wished that a stewographer could have been there at that time but - alas -! We then wrote a few worts to Mucker, Mr Evisan to be mailed . -

115 119 Secretarishote of Evento! initian Lee (A's acceptance May 24. Trachous & dansen left the having taken place offer the vote of on said fee, while Tracket was seen off to Europe by Secretary, James Marsen his soining was agreed on before sent vote) & to settle was seen off Sel. to the matter as we all want At to be with no have 12 Varren remarket long time Re question of next Outine between Dr. Ks - Can the was laid over for two weeks beasury stand an Outlain usiners Mectain Orace 19 4 resent Chief Miller Lees Vacigon Dyer, Wurth Sichert Secretary's Notes of Events Minutes approved & read. He June 19 1 Reel Tortal Home paralolly Freakurers report reads, approved Christians and Norwal all Wirth was Electer Treasur July 4th No 4th Celebration was & also to be auditor for account harly the Muckeyo, The from May 20 to June 19th. prospecto for a shore since The Freamer Haus (# 169 in this Klater Leason was accepted. Letter of asks multiplying - Owing to alread gast Mas read & the Chie of Chief we will have to authorized to clear up the holl it without Fing misunderstanding about alsothe other absorbers.

121 had business Merting mas forust Restaurant (lady's omitted!) Treasurer, Warren Whiting ! por was a most Enjoyable affair 916 hunisty 85. Sedate is Present Sees'y, Theasurer, White next oction mas det for July 21 al Warren, Viebert Cowing & To the Secretary to send potices · Howe lither Staaten pland or Bayi all left in a burch Except Warren shore dinner) to all mucker Whangked on the Youin that & X's. the treasure peporter waters of the Austran rippelled & \$ 300 Cash \$21 outstainin rock De ferry boats gellock Whiting brokoxal to boul the & a fine love side to Afterge. The tocasiones to insure his the course table of the morgaio ser Uppearance of the Driver piarra & Ocean breezes by way a was laid over to a fuller harrows Cooled our brows, while neeting a well prepared freuch repart to gradually slowly but surely hisappearing wito our "Mittel" Various were the Joinks from Commade to Whickey, from weak 1213. Vartato vere p glacet to sherry & Leotet. The Notified A. E. Howe the Conversation was que rond 3. That Auchers Hisher to Each one Contribu to come to the dinner July 14 plenty of pleasure in the Oth The usual carts were send N. W. E Holland was also kotifice

122 the Xmuckers and mail If you go meaner O'll fair 23 in I Stand atter the diener to Jake an outs exolled through the rooms an mobile diptace for a diene Laving had no musice so far au That's were you get # 13. was made to tieslesivos X pleasure out of a ris a happy crowd of pleasing We hope the Edison will daced ladies gathered parian in Our hext Outie The piaco at tablesin wine approved room & autside an fratta et miller program given was to be free a little blassical, but that seen ORANGE, N. What Svery one called for & brand Secretary's note of Events. We med the atters Church worth of & hely 28 ree letter from Hause Westinslause Co & up to 11 35 PM pleasantly additionledging peeci anjoyed many a Kappy draugh of S. I. law etc. Porisas densuinations aug of Trachold wrote norwegion a Splendid Cool ferry side gan kostal that He met Bellautin relief from the Holday and 4 was off with him to Dunelle by 1" stares' we reached aga Calling iron governo ating Notes the 1230 Del. L. for for 44, 30. Wee Letter from Harris In leaving the Laborator . . I sawholt who Sept 64 " Diffices in his Tracted in blue lives waxed Enthus favonte kosidion on Septy & Red Cart from Ray Loud Stoop Main Sutra also from Doe Rhas. Said = Tale go to

124 125 A Business Meeting was held a muckers button to be laid September 1941 900 in room XIII before a future meeting Present: Secretary Treasures Frefert I was proposed to sound the Warren Dyer the Leer'no report Exmuelero in segant to peaping was ready aproved The freas say 500 or st led a near be reported Chal \$ 100 due \$ 1700 postage of natices exactor Elected were C. Wurth # 22. It was aspeed to adopt W. & Holland # 23. A.N. Pierman title of 'associate of Huskers # 24: - Warren Mangema of Essau Laboratory for were appointed a Committee to who had been formerly muckey arrable & Lix Date for an at & Experimenters in the Ed. Labor in Patersan next week to & also for karties who are in Elisan had previously krowing Quential & hold Righ positions to take part in this Outing in Kresent & Luture Wissen Which was to be an Quito Company's. The names The Lecretary was ordered to Af Pilcubre & Wiber were pero invite to this outure Mr hosed as associate m. s. Lausden of Newark also Fred The meeting then astournes Ott fif he gals with us in White Steams & Bachman & any other part, her Nougeman who may be a prospertit Mucho Mr Whiting was appointed a Committee of one to procure Secretario Rator os designs & get prices for Thefore above meeding wi

-----

126 waiting for our Chief he Chifa Secretary 2.1 the honor 2 72 following Conservation the Horuplace Orange . -Suggestion To have a shot on file Of every Mucker in a specia Handshake 8: Overething like this: with Siquature of Oct 24. 05. a business Meeting . XIII'. present Syer (pr.) frehend (pr) Holland Tere y report read x approved Treasures reports cash 1368 Due \$270 total \$ 40 68 this is the high water man for the Strong box Outing at Sales 125 & M. will be held Friday Vorby 3 1205. He Ly was authorized to make all the hecessary arrangoments. all other business was laid and to next Meeting. Chapman carde out &

128 When the 618 kain read No. again Valses & ouvertures 2009 Harmonies - the line they show # 13.20 x 22 were loined by 21. 24 on Wagnes + 86 bully that was for & 19 x also invited quest of M. Land the light living Stalien, but havely & we Tproceed by way of Hekevers & blue L. to what proved to be a vishes for the Sugues & intricate enjoyable Oleting (on Nov. 30005 beauties of an finished grand al Walest Harlend 126 th. Hall Ensemble of Northern masters. He # 8. awaited us x # 9 chased up prefers the light receining brook to the overwheling thunder of a atter the Treasures gladiened the Heart of Messenger # 1095. We dated Kiagarian Jown pour. Miss Nine strong Laving enforced or Weltuer (a year older friend) and Signer spirito al Soundaino Bar when Luci Oriunno Solvisted and the de naught was barred except evil had Riguletto Luarto x a Opio le spirito. The meal was executeux Brass efforts & the Trombona the management arring 1/2 bothe espiably maline fowarts Claretor White fince our last Visit Sat the pky for poof! | ourseless to the \$100 Dinner. Oright fro We then Delibered and Sirst morrient an excellent poorise of to wather was of the Phirit manifester itself which Beaux arts. viz poetry grew unter the strains of our and Secteling\_ old friend (see page 58 x 72 Vecella) Wall started rolling By #249 Poaled again they randered arquests assigne a expressió parody an italian the Meloties with race Everybody brooks but father ? precision & artistic of wish ag introducing " ma " & dister au ove heart the Aixtet from o to show what they did do & can.

----

...

(31) hest came preture of mento annerable jokes ad 30 Park orchestra depieting one he Inha, small cornet, Frombon site plays were enjoyed till and intense leader . - The 1136 P. M. awafter bee new & mucker hand stake bykage 126 Some X'M's relieved their was augmented by an X huncker Stee Conscience by Laving every Vancething like this! are mint & winkile to the he next the opposite of forme one blac, we remember Dex 150 Depicted in gradually the "Frerman his. Zon Haldrate ballet. vernerof "! Cowing's Coming to a bowing dancer to greet no in sledt & pain mas of Mude, He Stade of the July acknowledge. Quee the all apple thee " - Jour offer of 'Dago's (hand) played Januar Mucken representing " gas "chomis well vota to be lost da Inity Roball' & So2 surraudin The exmusters bert postalears a Home crank was excelled the as usual & the Estimon advessed portrayed - a leading ladies By letter : "May success crown view (correct perspectly ag a stout woman in parquet as seen your untixing labor Energy and may Tealth be pure to Enjoy that Success from 1et baleaus) near Very Lanston was in tis Sterness Dr. Kobz' & Halian Vamoste' lease and cayoyed the Eve. He called's seme need ! the pip dream Lakeside Que draft artisto let loose but was very carefull & choice to stay preceeded he . Choice: My Marten with Namen & Cowing instead of choice and so Coming Homewald. The Rose they setterioux on a rea haired beam buryal

132 and literary breasted by Sceretary's Notes of Events as we drawk a Finale; autovoir Can received from Rad. - Bul: and again we pemembered the 8. Wrote to Tallact & Ras herman movements \$20. Kept us well fteamer up. # 20 enjoyed a quist time ! # 24 Jusiness meedice Voo 28# 05 Paid He Deeme , as of for Fresunt Vecretary. Treas. 22.23.24. 632 To 12 P.M. was h hour! broky 11.16.19.21. absent two muchen (He still was Soley at that! The Secretary & report approved, the Iwelve thirty was the train persure reported las autius's we took back tome & the Dues micollato \$ 250 fell by the waysive: cash on hand \$ 1152. - Med Outin firstly 8 x 9 in hew Look then was reciped to be at fouguins 24 Roseville, 20x22 Orange 64 Que 284 M. Thursday See 7. 1905. # 21 Sark Que - lastly # 13. Elected were as # 15, Rol a Back Lown Valley roads as # 26 Louis Oft. The names of We all regretter the still Mr. N. G. Bee x Mr Brodie were laid over to Continued absence of next meeting. It was decided to ack Mebs. Bee & Brotie also Ke Chemisto Forter . Dr. grothe and meenley There now for over two us at the dinex mouth to is wher our resual rule at their own resp. Expense!! At notion of \$ 24 it was voter

134 135 to supply 12 clay pipes and package of Honest Sunsking ortho of the Muckeys not meant to be a gag, breaked treats before or attel our Outing's or even during who attend the Business meeting Saule! A rule was adopted Towing approx to a waiters attempt at outing Nov 3. to callet a check for 3 times from Knakers & Extunction that hereafter all disbursmonts "See 1st few Out all potices for Dec 750 at Outingo are to be made by of make Kongins grangements Que Treasurer, who will note The amount due for Expanses from Exmunchers & other atten. Outing Lee 7 1905 to Houquin he Chief Leavy, Treasurer # 9. 19 x 22 Fauts x collect the same were joined by 23. 24. 26 and two from their before their departar Questo Chemisti Forster & & Grothe \$ 23 x 13 were appointed a Lausden & Grenley, Broke & Bee nox Committee to Notificahover showing up. The Repart' was a anned of Our regrest to attend The best, do we set there the Finner also the Scaretary 8 to 10 2 munching the believe isto circulate a prepared dishes courses of members the result on Saup, fish, steak. Capan eacl on arrangements mass as dainaly prepared & served the mongnino muchers enjoyed hear the her N.B. The above adoloted rule was of the table thepresence of ant

136 a good Orchestra close by the proximity of easily 137 was followed by Neapalitie Vinge chaked french ladies - So & Louis Youquin from the detail once be unconsciously be. ministered to our wants by aliped that the muckers are lew french directions spoken growing! a big round table of a on to the waiters. The ice in a beperate room would Vostoni smaked of far away have Lilled the Parce - buttered Paris & the Paffee had the task not have given to us pleasante aroma. Even on Our table Spent hours. As Edison and Dr g. ete introduced the Cosacopo Ex M'p & absent Ques were litan by palebering Englishremembered by usual carts French Jerman His atte & letters. From 1030 to 115 at Franslating jokes vibrates #13. drummed on a veri Our laughmusales after on tablement piano ancien. the lower half of the festion board this music of you relieve While 22. 3. 19. 24 m 9. Kar by a charming Basitan love their heads glosely together of a set of "Usless at a dienes" for minutes at the time & ment table to Ours.) Mr duinty to only relax their bent was the Jeuts name Chainerity Re back mussles & throwing Olub Man!)! Coffee, cigaro, Cor their hears been 'Roased' dials & Confusion of voices Well the lower sud of the the Egreat: "C's of freudstyles on doe the accasion a memo. Table could not well quest, the propriety of subsuce toll Jokes on account cable one for us all. The general

138 The most marvellous in the strong box indian (39) novation was the calm and tashion greeted by raises dignified mien of Our belove x high lipheld hand To & darefully quarted strong Own warwhon har Keeply! Weel - 150 ks plate - 4 for a Sollar eigas - 20 kg 3 you a half draks. shated then as little as Is longin send over formerly a 5th Cooney Island to Mr Is son the less hox schooner would have disturbed Commenter 2 crackers 4 him = "Pragneso"! was depar toothfricks - which at the & on his pleasant brow - for request were prompetty he had & he Ruew le had uls to the Louse i. The Goods on him and a minuit fas the french not Que of us daved think say me tramped by 6 ane When did the get it ? - the Tilles being tald of our can to 23 M x per Del Lacka homeward - all beleased outing & hearily of the Kall had belped to and another \$ 150 Hate said: Recklers: pleasant nemory to each You're getting reckless. Levery one plessent! and low & behold low approach that expression of our Miller ED189 beloved master ruffler not the stoic xealin Conservation as the of

140 Secretario notes of Events: 141 1906. Dec 15th Received latte, from # 1. & a Dusiness Meeting was hel a business meeting was held Dec 26 to 05. Spesent Fedy Treas. 12. X111. January 232 1906. 26. 11. 18.19.16.24. The latters Krescut deer. Frans. 11. 16.18. 22.23.24 The reading of minutes on the final 25.26.27 (5: proxice) Veretaries report reports for 1905. Were law over to was approved. Treasurer's report heat meeting. cash # 726 Dues # 34. 45 was approved By general & manimo The Kext Outing will be held on acclamation the present Fels 1 th at Jonfarones 8th Steor Medougale N.Y. City Invitation are as a body were recleated by # 22 casting One Vote. to 62 given (by # 26) to & grothe & Electer to membership were # to 1. J. Bee as # 27. and to. N. M. Brotie as # 28. the 4 Chemists Jucentey, Forvart Hause, \* Factor (by 20) to near (blog 22) The pedrawn Constitution (as 19. Joing away shortly. The Seasing approved by Our most Envinew Coursel, # 11.) was laid before of two do felich x buy a the muckers to be voted on at Our next meeting approved.

142 Secretary's potes. 143 Grescull # 13.9.19. 20.22 28 24 25 lives rakes at Each other, & I of good cheer at as excellent & music fistinofly Hinles whele Each one of Italian including a Demor - Que #5 & a Ferras Lignor. Who Delitate irst one in our association us, often Juring the His last to he Eternal The lauching & general Ins - Stumber in peace me of the less George P. Hetherington, aged 26, for at Our Outin experienced bruskers Fried the three years a resident of the Oranges, died after three days' illness, from ap pendicitis, at Ashland, Ky. He was chemist at the Edison Labor-Fel 1st the Much Rando at Histing - Several Saux to the atory and left here a year ago to become Peutleman were attractor to head chemist at the A. M. & I. Fur-naces at Ashland, Ky. make a speech at us! Que The Muckers Association of the Edison Laboratory and his many friends a quother told us a here will regret his early death. He here will regret his early death. The was a bright and capable young student, an experimenter and worker, who in life was a friend of good cheer to everyone who met him. He was the first of the was the first of the control of the start of rient and lat about "Disk" machines Ist neveral meriment "Muckers" to go to the last—to the eter The Secretar 3 we took the 12 all frain howewar ordered to sein MUCKERS three year old boy. Thomas advertises work of Condole EDISON to tio family alriet.

-----

144145after several failures a Cuting in Orange March 13th 1906 Dusiner Proceeding was The largest Outing Ever helv, was our held Jebs 27 & at room XIII Finner at Otto K'p. Fresent Chief See. Tresent personally or by prox Treas. Walt Miller aylework Presuman # 13. 20. 22. 23. 24. 25, 26. 27. 28 Bachman Ludwig Off & Wa Bee Lausky March 13 5 was set for an Cowing . Warren Sinan as questo 2 auting day to be tell at Other Chemist dr. grothe, glaister also Rodges Hareumay er's Come Frand the from Genni Seet & In Backman. He sat Feary was sushoned to make Town at 820 to a bell prepared Jerman the arrangements & to invite to Weler, Rozela 3 Chemisto & style dimer: oysters, foup (Sea), Roast (Hanerbraten), Chiek on toash, Pegetables horo Vacuures, diverse cheeses & pies. several atters & an Execulent Coffee\_ Claret Phinesons Il was proposed to Enforce & laburger Deel \_ cookdails eta eta! a larger attendance as Pierman showed off a tenor voice these meetings. in real Concert style fouly his work approved were uttered ristinatty, & the Whiteman EDISON TO PROMISE rebounded from the wales to tearing with frue inagnetic attraction our Scorttany notes of Events. Febr. 11 & a bottombale bouques a laugh muscles every which may. Dr Grothe grotesquely gave us an Suitable letter was send to Ram 9.814 Several Longs & He Happened to be there very largely - His initiation of the roise of a Timen meane is buttle On the occasion of his 59 & hisklay 4 21 Preceived letter from Min Vokenin

·

1 % was very Excellent inter such as few dociety o ept7 short of His illustrains ances Mr. Elijan vaccationing dr. rederich de goothe; due was addressed as follows most generally and Eventuality at the beginning of Our Outing we to aster): to an overdose of BE 2. In Wishing you, to have in your habitang the although his depth for meastring needed x well deveraed recuperation his Capacidy) is to us an unit . Fram our festive board we ale quantisty - It undanstelly had how send the greeting and Our tope for the pleasure of liquid fullness you: Wealth - and Health, that tels! both in his avair du kois from the This was progner by Swenteen as also at his palina! both 15 postaleasts were send to absente de swallows with marvelous and & muckers! I There are a year of regularity, Showing medicinal and as were Sighed out from hieron an exactlent fystern om assent or implomentue. # 13. gave a few practo Munter Willi B. told of Derguan giving a to loth willing & unwilling Beslin genius (leaving the Storage Batt. listeners. The convergatione" stunt, here & in Tleuridge ) \$5000 to was augmate & many as take 3 out aut to a N. W. Dinner This joke vibrates in the six hu Behrendo remarket to B'& interes Our artist Friend o (# 24 am ' six weeks x over x spend alread, 600 d. m. Lausden in in graceful Marko - an Expensive life it is the curbed lines produced dew ju W.S! - hot Knowing were to go Ohoice acricatures and Is lengtook the Borlin B in tow war. in it all, the assembly & they got damething to Eat Poil showed a spirit of Cortially \$ 2750. Up paired the Dutahua

148 Hair in layers (of was well wax et & poulastes ) and Bice nother Wash ony mother the SA9. Satrick's bishlay question! Bhad a H - aftorious time to (8+9=17) ultimately climated in Darky stories! Billy B Convince the Berl. B. he should pay it out of the Benevolent B. gave a very about some lo (Berguans) \$50 Find - When cep Belle's, accurately describing cries the immitable Warren towns, & stances, & general seener, - Billy who was the Mark ?? - at the finish a Old reliable # . after the laughter Warren con, 8 X. Sily asket: Vailly, How. Much so the Sare! Choul 12 3 A.M. Hard 14th timeer - he's a bird - a birda lack! - His fable & mulder went out for a lack before marries. we brake up to pass to the auti and = te - is room; gradually the Muckey Some pack of the dingers nece Thoughtfully stepped Loneways yet few - [ those of the Owl Disaussing very Veriacely the auto question (while diman Wint I stayed to course our experimented for to swallow X # 9, for the above 1212 esta. a teaspoon of leavers honerary blisher itself by afore fait & having lost the 12 4 ain & When some one recited the free the next h. y. opportunity (viz. & often repeated story of indigenting 1+44 17) the cilibrates #9 got by Cheese as made by Dithing Buch invited to Res. Frants dining a hoursbreath. Our \$ 19X Keph his prawise to either with broken heard - Latest ata go to Boston or come to. Hipporyone - grothe from jung Outing by going to Boston. ayleworth Fratie & C Hurth wer

1 He only absentee's Honor da 151 25. Be; de mookairo Haus 31. Kie Letter from # 15. Jausen allprite! of yes of yes Real Cart from Frankold april 15 I fell allowite laast Do Ross. but to day - (staking his law) right left right lifter Real Krite ass go Desiness Meeting belo May 18th of The cost of Our Outing XIII. present is banner figure \$ 4460 . 26 proxices 27.28 × 16 × 11. Secretarys report read & adopter Letters x postalo rear # 24 th perign Ohref Smucker son given was accepted Treasures reporter cart \$ 1105 Dues \$ 5400 (inel May) accepted The constiduction as rea approved by Course Dyes (# 1 A slight change in rea associate Membership voter ... a Commister received 11 x 13 was created to Up Souce Bylaws for the C John OH was unawine financial) was Elector to Honovary Members as # 35. In the Election for his tauponery besignate

152 hew nuckers fore passes present were 13-19.20.2223.25 26:27 Greenley as # 29 Rogers as # 30 18:30 \$1.31.33. 8 8.9. Hovard Hopper Saller as # 31 Hoss is as # 32 M Laurden as # 33 Fred OH as # 34 The usual carts were send and The # 33 was election Associas to Mr Edison (absent an an auto drip after Cobalt, having an one Mucker -. auto a chemical Calionatory outfit) Cafe Boulevant in R. y was we pent a bill of fare mentioning for the different courses Chemicals dediced upon as our next Outing place for Yay 24th used in the Robart experiments. Start Del Lacka 634 PM arriving the Coattail was taken It is proposed to save in the front part of the house I by up some havey to hald bountines in July or augus Den table was perly for action. The Chewistry Element was on the a full days Out one half of the table - the leavier Okproved Elementiciano & older ones a the other . Ope During the Evening groups of 3.4 or 5 sould form with an occasional shift of seats, bringing thus about a very harmonious social feeling which made dvery one enjoy the evening. The Hungarian ban awoke the musiclovers to ma a Rearty Landelapp. During It had been desired Not to a Evening Our \$ 25 Lend a postal

Monday June 4, 1906,

a meeting of the Muclees was held in soom 14. in order to decide whose the best way to honor our beloved

Sectory Mr. A. J. E. Wangaman who same to a very sudden and unefected

death at Bath Beech june 2, 1906, 31 was decided that all the brother. Muches atlend the freneral in a body

and that the following resolution should be adopted and spread upon the minutes of our slub:

Where by the untimely death of our late & seeing a J. E. Waryaman the

Muches have last an efficient and zonocientious officer, and the members thereof a warm true and loyal friend, where good nature, surry disposition

whose good native, since eight present, whose good native, since disposition and inscript, character must allungs be treasured with the placentest necotled

It is resolved that in respect to his memory , this statement of our feeling

154 merrity an its over - come.
There of the West once of ment of the West once of ment of the West once of the state of the great approximate of the great approximate of all. A state of 12 traditio for

a benefit Drawing (500 trakes at # 100 Back) for the Edman agent Back galuppi who

los everything in the San Frie last file to the San Frie last flack to the last the last fully. The Club took the last

The dieurs was excellent & at 1130 we broke in two Raities 10 for Orange &

8 Stayed in New York -She live was considered a great one in every man approved MUCKERS -

a great one in every war officers MUCKERS.

EDISON WEST AND THE

Chief M. Hoto of intern

be spread on the accord of this society. All about members were notified. Ourceit at the meeting.

Maser blas and Eller Murth, Degar, Holland, Greenly, Bachmare, and Ell.

Business Meeting, Triday June 29, 06, Orecent 6 hig Brussway, No. 23, 25, 26. Report of 14 26 activity as Sectley Since the death of our like Sectley Law approved, so also the munils deling to our feelings upon the death of No. 13

I he appointment of a new electron was in order. No 26 was appointed by accl-amation. I her arrangement for an outing were unfundly decideded upon

No L5 suggesting are ordering upon some watercast to fasts whenover to us as yet. No 26 Jungerold the sear

. of auto touches to Italian deland for a show dinner I he matter was left by to Ma bheef No 23 and 25 to heide upon

the best course to persue.

Clerting July 7 We all went to Bayonne in automobiles present 1'2 bird Treasures decetory. No 7,8, 9, 20, 22, 23, 25, 28, 39,31,35, The Top

was made in little over an hour over the beautiful Numah meadows accorded with historia Mr. Harris and his pife were present, also his jorial humor

was with him. close one suggested that the het place received wight be good footwarmeest, and that the earlit used under

them came from Marys room.

The dumer was thoroughly enjoyed to much
we that our quide mined his way and
but we about ten mills ned of the way.

which we scattered in all directions were mental of the trip was quite commend. I'm car was not of water wheelpfon we

line our saw out of water wheelifeon wor defped two gentlemen? whom we asked wheel we could get water and were informed that

it was after 12 which and the whole state of forey was dry, you would not eaven yet water unless you another the junior of the billy that

to deal , some to design .

Cash in Treasury

Total

Paid to

Balance in Dues till

Meeting their as

Business Meeting Wed. act. 10,06 Present Treasurer Sectory and Muchers Nos 20,22, 23 & propy 25,34. the the question of laving an outing was brought before the mostling . I two moved by Nos 25,20 That we have the outing in Crange . The motion was swended by No 22 and carried Second motion by No 25 to the effect that we have our inciting at letto Katermayors was recorded by the 34 and carried next in order was the question of inviting question Two persons were suggested and incommonders declained to be unacceptable, for various will judged reasons. Therefor it was brought before the committee to invite Mr. Gilmore whereufon Meises Gilmore Webber, augun, and Rondolph were put down us invoted questa. The refert of the Treasurer which was next in order was read .

10,44

67.00

\$77.44

.75 for one rubber damp

Present lef Lumenes Sentey and Muches 2 0 22,23, 25, 24. Cen account of the death of Mr States where at our previous meeting we decided to have our outing it was decided to have our outing at debil- Stiller in Newash. It was decided to have all dues paid every worth in order that the sum is not be so large and also that the Leaverer may know the amount of rash on hand before an outing. There is to be not the the the Busines Meeting Orwert. How thereny a and the Worth H. Holland. Mr. Hoope elected a number and Mr. Writh to see about Mr. Gaul as o drawy \$113.00x Una deviled to hour as buty at achtel Stiller in Neverle for 16 as all thought the Edin would like to some if it were held wares bonne . Westy adj

Business meetine act as 06

achtel Stellers in newarle. Present Mr. & dison and all the Muches except Nos 7 and 29. All the members enjoyed a five evening . Mrs. Walter Miller had asked the Muchees to invite Muses beollins , Hastan , Bentzles and Jandas Mr When was also freeent. Mr. Bentylers piens solos were received with enthuserin as were also Mrs Jandars Violen Lolos who put feeling in his music . Mr bollies and Mr Haden gave dute in great style Leave it alone The Handleyon Man cet . Mr Eduon come in later and rande encylody feel merry. This meeting through the landwess of Mr M Miller and the invited quiete was made exceptionally pleasent. Her Muller are all thankful to Me oder for his landwes in paying the entire expenses

Present duasures decretary and Muchers No 22, 23, 29. Some of the Muchaes who lanew of the meeting having been up by the Suritary and Treasurer also did not appear so the question of fines for the was brought up but laid on the table It was decided by all to have an dutin Jan 17, 07. at either de Hoflian House Lichous or boje Marten . The Lecretary a Treasurer were appointed to deade which would be the best place. On the 9th the report of the consitte was your overy the blind and decided to have our meeting at the

le ashon hand Incl. dues to Feb. 1. Iotal 145.00 Refort of the decretary was read in regard to furious makings and accepted is Priviled queils Moses tilmore Weber May bolling Harlan Bentyler Jandas and Wall.

Hof Bran. The report of the Treasures

was read .

W the Hof Brue House Rear forth big Oursell Chief J. Wille Luns. a Grad bety F. W. and Mules Nov. 9, 16, 19, 23, 23, 25, 27, 28, 30, 31, 32, 32, Oursel as bant Meses Bentfer, Collin,

Jandar, Muray, Alinen Porter, Mr. Moyer had his ferr experience with The Muches at this Prenew.

Mr. bollin gave as som of his well known bron Longs. but he also abund us that his rover at one twic work well adapted to descreed mucic as

all of we were ware of when he easy to d stand on the tradys at stellaright is, the local property is to be standard and the content expensions which build defend at the close

of our meal otherwise we might all be here to imput our courses. The Muchen were all interested in

the Freye decorations which were

all of German origin .

Mr. Whiley we was expound to one of the Muden would not be thee, But we all see that be has proved himself a faithful standly to see presidely.

13

Nov. 18,22, 25, 28, 36 By Jung 23. The Report of the Secretary in regard to the princies business meeting and outing was read and

sacefled Report of the Freaures bash on hand 21.04

Total Incl. deas to 7 et 31 = 51.04 read and accepted.

Amount expended at last Outies

13.10 Juin 7 Bar 76.25

Special Merrys

Next in order was the election of officers

The same officers being une

6 huf J. V. miller Trias . a. Wirth

Seely . L. att .... wi ....

Muches + 18 suggested in this election that on account of no diverfung in funde

our treasures should by all means be weleted.

Mr. Buchman it was voted upon and accepted Mesers Weber, acker gred & and even brought

Me Mozer was proposed as a member by

165

up as members, but the motion was given over to a comittee of Two (Me ayleworth

and Mrs Holland ) to consider and report at the next meeting

next in order was the consideration of an Outry Mr. Bee and Mr. Whiting

were appointed to arrange the time

about the muddle of april and the place had be a new one.

8 I was also voted to bring up the question of definate Unitings at our next

Outing so that all present may be able to role upon it.

Meeting adjournal

P. S. The Constitution was to be considered

ut our next business meeting

Present Muse brooker Holland a Abourth to Mush I. M. Mille. - She number of feefle were few. Mis have found a success.

December Meetry July 1 07 I meetry was held to go of loat to B ayone and lare a short dimer. We betyel was to be asked if he will

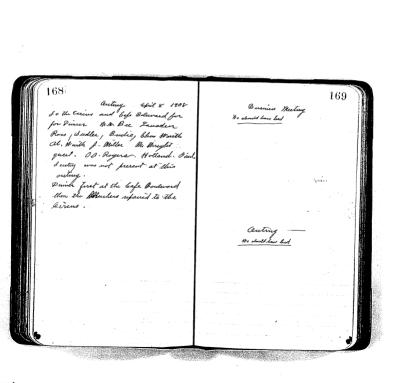
led us bean his bout flis was to be a Summer lackup Breund J. Will a Muth W. Goldon Etnewy own is loop & Cut - Multi- Much adjurned

Mr. I all a member Muse thele and alon event taken

Present J.V. Milley Wolland, A Mush So of Present J.V. Milley Wolland, A Mush So of Norgers Stowns moved and seconded that Mr. astrongers to lake in as a supericle.

and a conclue of there afformed to inquire into the matter. It was moved and recorded that are only be held spil & 1708 to the

to be served afterwards to you to the Gunes.



170 This meeting was held to determine upon Dues, Permenent Outries, Initiation Fees · est. It was noted that there shall be a definate number of outnings in a year at a deficiate time in the month in which they are to take place It was also voted that the due shall be one or two dollars a year or therestout The question of quests paying for duners was trought up this together with the proceeding subjects was left to the officers of the association to frame up. this has been done and will be brought forward at the next meeting Jan 21 4. 08.

Present the following Muchers to Dyes that I albut Murth, Hoper , Rogers, M. and y. alt. Holland. Election of officers was the first thing taken up. "The following were elected J. V. miller blief a. Wurth L. L. act Secretary a Comittee of three was opposited ( The third menter of comittee being in depute.) Misers Holland and Bee Sunden to arrange for the four regular and any special ocitings in songundson with the three Afficers for the year 1908. The by laws were accepted and will be arranged by the three officer of the Muchers

173 O warmers Meeting Thursday Sept 3, 08. Present blief seety & Sussuer Muches Sudle Rogers Holland ( & proxy) Hooper & Greenly. The chief proposed an outing to boney I sland this was decided upon and the following arrangements were made Outing to be held Saturday Sept. 12,08. to bony I sland gury of the 22 nd st. boat at 345 RM. Dinner to be at Feltenous. and so an thonorary Quest it was decided to have Mr. Welgel in return for offering his boat to our use and also past service. Meeting adjourned . P.S. Moned and seconded that Mr. Relph arborgast be elected a member motion carried,

174 175 Mov. 6,08, Prim N. Holland J. V. Wille allet West Present Siller, Ross, Fansden and Jeorge Hooper . I. lett . V. H. Miller , Bee , G. Wurth U. Hollord It was moved and seconded that J. V. miller a. Wurth, Beryler, El. Mules, Byron Harlon, Monsham, the Muches have an outing Nov. 608. at. achtel & tetters. II was some! Questo Wright, Milliben , H. Miller and seconded to have. Theore Harlan a.M. Hurde. Held ut achtel and Bengler ect to give us this talent I tetters Sectraly was not present if we could arrange for than . so I succeed reports from a. Warth O.O. Progers and W.M Broder fromised Bell amounted to Lotal Rell . Theren Harlan Meeker and Bengler entertained with fopular rongs. and johes.

about home to have as by meeting for the election of affects it was about decided to this meeting held at actility of hear this meeting held at actility Stitlers or some where else in Mework, the motions were all exerced and chargen Febr. 24, 03, should be modely so the Big Meeting? Meeting of the Big Meeting? Meeting all three money from the wave eage fastion in the halling of the Edebratory! Outpart to short Meeting to Meeting to Meeting to Meeting the Meeting to Meeting to Meeting the Meeting to Me

This meeting was a world one Felt course of the faithful three blief dreasurer on Secretary I I was decided that it was

Business Meeting Feb 1th 03

Mr. Podye & Mr. Benden fortan in Hombon. Cleded as Multine unwanted Mr. Bodys & Mr. I or Mr. Mryon ich emblend Mr. Boe Mr. Homeden. as countre who was out in the other revous a bay three questions en la notify than sifon their election. bhig. Mr. Bee and Mr. Eglewall une nominated Mr. Bee 10 Befundl 1 Mr. Mithe! Cleatine sucche enversemences by well. for Mr. Dasseligh Mr. A. Mruth. consummenty

32.08

22.60

Cash on boud

elected frus

Expense account.

178 Scientary. Moved and Seconded Wat Mr. Walter of veloud be made Secretary Mr. John Willin elected as channer of the counter Leclind. Mrs. Jack Rass elected as chaining: Mr. Malter and John mitin as medis of the entertained committee Mr. Pyen letter recess not present. that of thanks to our setise Word and seconded that a 2. Cea. Brought up the subject of being lectures at some of the Moved and seconded that the interto committee shall be instructed to have lithues at a scientific or

204 29 Il I Preenley New Wally and New Mally and 30. O.A. Rogers ein rije nj

206 Associate Mucker 33. J.M. Lanston fr 2 Municip Place & B. Let 3466 W. E. Lundden & 0-840 50 78 B. Ble. 54 M 4 E. R.R. Mu Musch

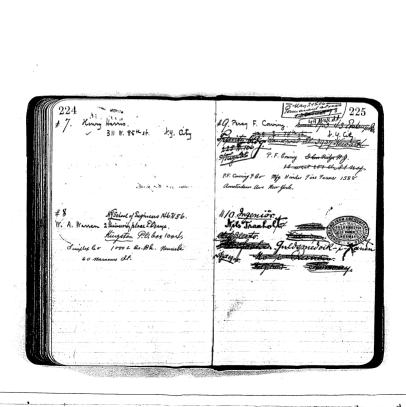
!I. Mager -375 Fullon & t. Brooklyn M.Y. Adolph Gaul, Mr. Rollh arlogast.

215 Fillieur. R. Ratn 1904 1903 1903 Jane 1902. April 1902 Heril 1902 Dec 1902 10. April 1903 Feb 1903 Febr. 1888 Oct 1904. in 1901.

216 217 List of Muckero. 23. 24. 25. 26. 27. 28. 29. 31. 33. 34. 35. 36. 37. 38. 39. 40. 42. 43.

220 627 W 136 At b. y. City

of died in 1906 Hh. Material profrings and talten. Telknisha højskolm Stockholm, Sweden.



226 A She & Wangener God 2.06 Such Super #12-

228 # 15. Martiew Hoodlemeers Comp. B. K. D. W. S. A. Bruitin S. \*16. Walker K Miller 28 Med Verren aug. 18. I. M. Aylsworth 223 Hirland aug. 2004. Corange 65 44 am 14.4 ist, 230
19 Allon Whiting Glenning Bods.
19 Allon Whiting Glenning By 21 Algeron V
2 Minumenty at & Orders 231 atlantic Motor Car Co. 5 17 High H.

232 W. & Holland 24 ashington and 25 Rob A. Backman ion Wataking doc. Nort Orange House 26 Louis 1. OH 175 high 81 Change

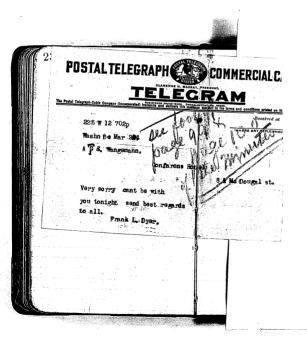
Pabst, Harlem, N. Y. May 19th, 1905. Our Dear Nr. Edison: . Nuckers assembled in a farewell dinner to Tranholt & Hansen, after toasting the Country remember () foremost the man we love and revere. Many a times praises and eulogies were spoken, but none as hearty and simple as the sentences given from the heart by the ones closely connected with your work, as were heard here to-night. If ever blessing and comfort came from the heart of the Young in admiration of their Master, it is from ours, and we wish your lot to be a successfull one and in health to enjoy for many years to come your life work. We\_are always and ever your Muckers. .Warren. Whiting. Wangemann, sec'y. (Absent:) J. V. Miller, chief. Aylsworth. Worth. Arbogast. inned pag

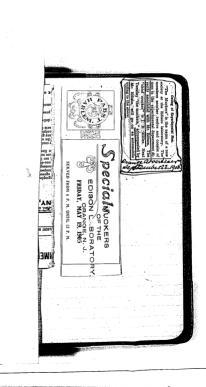
Copy Set 11 - 1926 235

Our dear In Edison 235

Our dear In Edison of your shorain, the modern of your shorain, the to for their best mines for the coming year.

Near glad that lad years illness have a shorain the man of the lad years illness. has passed and me ale Rope a continued contender Rappinero in your life & \* you want of #1 incress stoom to those feet and complete search and a •413as •41as... -patting lidino erollit er e .00011









# Muckers of the Edison Laboratory Correspondence

This folder consists primarily of postcards and other correspondence from members and former members of the Muckers of the Edison Laboratory. Included are letters by James B. Ballantine and Nils Traaholt, written at the ore milling plant in the Dunderland region of Norway, where both men were working in 1905. Other items include bills for dinners, humorous sketches by A. Theo E. Wangemann, and various versions of the organization's constitution.

Eight letters from members or former members have been selected. A copy of the Muckers' constitution can be found in the "1906. Edison, T.A. – Employment" folder in the Document File Series.

Heury S. Harris March 19 & 1905 The Secretary of the houckers, ned 19/00-Express my thanks to you all for he notices receim notifying me of morting, also for the pastel from the buch at Pape Boulevand. am glad to southat law not forgotten

I reget pinearly that I shall Since learning Strisms in Juny 1903 not heale to be with you hen held two other gold, both mon outhe 24th, but hupito or less as a mucher, in Brooklyn he sable to join you some and web- and in September 1903 ture and say "Skol" to the I mut to the University of Princeyhour erond our a good glass of to study chanical Engineering Kulmbacher. That is my present location, but May but wishes to allow all unties addressed to my N.Y and new Muchers atoms will reach me all Iny succent Harry S. Harris. right.

109 West Boll ave. aslend sty., april 113. 1905. Sec. Muckey of to Edison Advistory Orange M. V. Bellow members: I meetings receively and was entermely borny to meet mot alle some. I am located in a small tom. on the Chin River -Coften wid Sweet book in line with regards and best wishes Deny truly,

THOMAS A. EDISON, President. W. S. MALLORY, Vice-President. EDISON CHEMICAL WORKS. TELEPHONE "86 BLOOMFIELD." SILVER LAKE, N. J., 5-18-05 Mh. N. Traaholt Tres The Muchon of Edison Lab. My Dear Bao Mucher; Bro Hansen today handed me a bill forty, 2 for initiate fee I rach for dues during the mouth of Opila allay. hun I souled the Muchers I districtly understood from M. Miller that take was no expense connected with it whatever funcies & went to N y to The Outings Had I known therewas Ishould not have joined then army friand. eial condition would not when ? me doing so Thereford Ineface to pay the Suitato the Muchen of Codesch Zala

your Very tuly

San transisco, Calif. June 25th 1905. Mr. Wangenaun: This is just to inform gou of my address which is: Company B. A. C. U.S.a. Presidio, S.F. Cal. You did not expect for find me in the army did you ? Well, I had hard like and could not get work anywhere Washington, Orag. wor Calif. How is everything? se remember me to my

friends. I forgot my slide drawer. Would you oblige me by looking it up and sending it to m very busy all day learning the interesting trade Mude Lauris of being one of auting you for part friendship and favors, belleve Yours surcerely, Kjos Hausen.

Storfoshii, Dinderland. aig. 17th 1905 Dear friend! I will not exerce myself; - the fing is plain enough ! - Tim been dead to the world ; - dead as a dornail trall my friend, muchers, the jolly good boys : Tim bien studying the depth of a pair of the eyes, and there I found a world of my own - It is a strange work for do for a minches, and the methods used upon all laws of reason - - and les me bell you , - you ear never exhaust the field, it iskip like rinning a series of experiments, The lever. - But the resides - que vise! - The newer fell the suistion by running a siccessfull Aperiment, and if my externed successor means what he ways on that probate and he too not know, bethan he is hacking about ! I army you, it is much more fine, blean

to collect quarters from the unickes, - and - hush - Sho have a scrap with the old many one beloved mucher-antings ask in it, when it is talk alone at happy have of wind doesn't make if the fortpash is correct or Jam now in this jaint work hard more the heavy lord of respect as shirt electrician, - which some contentible individuals here love to parte Lase on I will give som orm interest this time only two, - to get an idea of see I I could roass 2 regiments of nice far Orange cops in multiple in the as , I ha ville persentage of grown - consent 4) We have 150 tous of another leave calle ruly in this part of the withthe, and I have like to ... to see all that money storm, injo in the seen! In a week we will try to rim our p and if Fair most killed driving the assure saintel son her from me again With but regards to all the muchen Treman James her Storfo him to Rance Milo Transcer \$ 10:

Newark N.J. Sept 20/05of the Echion Laboratory Orange I. J. Gentetman I received this day your esteund notification of my election to membership it you club, and I hely thank you one and all for your kindness in votingme a member. Should any member at any time have any doubt is to my mucking qualities they can satisfy themselves by Just one look into my foint in building #20 South - West corner top floor. The bunches have not been cleaned in six months and the flow in two months. Your Truly Entered the enfly of the alexander & Preman 327 Crange St. Jet 1889

Standard Construction Corporation Limited Dunderland Works Suldomedvik i Ranen Dov. 27 to 1905 Dear Old Muckes Frances. I Know I own you many apologies for not answering the P. Es you have sent me from time to time. as I think I can lay claim to have been the hardest worked as well as the distest muches when among you. I think I will have to let that stand as ong excur because I do not think I have changed much in any habit and writing has ever been one of the greatest bores of en fife The mucho bulings I had the pleasure to late sporting will ever be a very pleasant memory one. " and is I have Smether trackoll with me have we have many talks over old times. What a change I notice on the list of seguatures only four that I know and one hos of them muchor when I left gow I wonder how long it is going to take to clear out the last of the find tim muches I expect I shall be here till about June when I hope to see this place in good re Trace holl - I expect will fell the position for when I enjuged bene with evedel - & himself and the long got a big handful but I think he will rise to the oce

With Kindy- regards & all my old friends I remain

To the Muckers club of the Edward Baboutory

Gentlimen I herry tender my resignation from
from your pleasure club.

My reason for resigning which is person I trust

from your pleasure elect.

My reason for surgence of which in formal) I brush in the considered as a a softend on the maker as a feeling on the maker as a train the good will of the maker in the future as I before I have had during my membershy in your clad.

Withing you much pleasure in the future and trushing I may have the offerdurity of fining inou at twenty I amy have the offerdurity of fining in at twenty as an Ear Mucher I big the remain.

N. R. D. gave personner, as reason that he found

the masonic corter and har an extra life inser, hance, which (two) Stenanted all his space lash at present and He would join us as

Timero any time the cauli'x mones regarde the Miches at a date he hope not far distant & when easier or!

#### SUPPLEMENT TO PARTS I, II, AND III OF THOMAS A. EDISON PAPERS: A SELECTIVE MICROFILM EDITION

These documents cover the years 1878-1914, with most of the items dating from the 1880s and 1890s. Included are correspondence, notebooks and loose notes by Edison, technical drawings by unidentified draftsmen, agreements, scrapbooks, unbound clippings, and other items. Some of the documents were misfiled in later years of the Document File and subsequently identified during the editing of Part IV. Other items were uncovered during ongoing archival processing at the Edison National Historic Site. One letter from Edison to Henry Bentley, dated March 1881, was stolen from the site in the 1970s and later recovered. The documents are arranged in series, subseries, and folders that parallel the organizational structure of the earlier parts of the microfilm edition.

The only document from the 1870s is the agreement, dated December 31, 1878, among Thomas A. Edison, Egisto P. Fabbri, Grosvenor P. Lowrey, and the firm of Drexel, Morgan & Co. This agreement gave Drexel, Morgan & Co. authority to obtain patents in Great Britain and Ireland for inventions by Edison pertaining to electric lighting and power. Four documents from March 1, 1881, are related to this agreement. Two assign power of attorney to Drexel, Morgan & Co. to secure patents in Great Britain and Ireland for Edison's inventions; the others appoint Fabbri and Lowrey as trustees of his inventions in those countries.

Several other agreements also date from the 1880s. The agreement of March 23, 1881, between the Edison Electric Light Co. and the Edison Electric Illuminating Co. of New York provides the local company with exclusive use of two electrical power stations in New York City. An agreement of April 30, 1881, between the Edison Electric Light Co. and Miller F. Moore appointed Moore as head of the Edison Electric Light Co. and Miller F. Moore appointed Moore as head of the Edison Electric Light Co. and Edison Electric Light 1882 relating to the assignment of Edison's British patients to the Edison Electric Light Co., Ltd. All of the agreements from the 1870s and 1880s have been included here as part of the Document File Series.

In addition, there is an exhibit from an 1888 agreement between Edison and financier Henry Villard. That agreement, which was filmed in the Legal Series of Part III, gave Villard an interest in twenty-three of Edison's proposed

inventions. The inventions are listed and described in the exhibit. The exhibit can be found in the Miscellaneous Legal File.

Among the technical material from the 1880s is an undated pocket notebook by Edison containing notes regarding chemical compounds and their reaction to heat. An 1881 unbound drawing of a reciprocating dynamo is also by Edison. In addition, there are eleven oversize drawings by unidentified authors, which appear with other oversize material on reel 179. Eight of the drawings are from September and October 1880 and concern generators for electric lighting. A drawing made sometime during the period 1882-1884 involves a field generator for central stations. The two other drawings were probably made in 1887 or 1888. One pertains to a pyromagnetic device. The other relates to a pyromagnetic generator and contains manufacturing instructions by Edison.

The correspondence from the 1880s in the Document File Series deals primarily with experimental and business matters at the West Orange laboratory. There is also a letter to Edison from Dr. Richard D. Owen, a son of Robert Owen, the British utopian, social reformer, and founder of the New Harmony commune in Indiana. An 1885 book order by Edison, drawn from the Publishers' Trade List Annual, includes works on composition and grammar, philosophy, psychology, mythology, and economics. An additional item from the 1880s can be found in the Scrapbook Series. The book contains typewritten transcriptions of local newspaper reports, illustrations, and other material relating to the exhibition of Edison's inventions at Mechanics Hall in Worcester, Massachusetts, in May 1884.

Two notebooks and one pocket notebook are from the 1890s and early 1900s. Two mostly undated notebooks, used by Edison from the late 1890s through 1902, provide information about experiments on electric lights, filarments, x-ray machines, and storage batteries. They also include notes and drawings of railroad cars, conveyor systems, and rock crushers relating to either the ore milling plant at Odgen, New Jersey, or the cement plant at Stewartsville. The pocket notebook, part of the Company Record Series, was used by Edison during the period 1898-1900. It contains notes regarding the performance of equipment at the Ogden plant. In addition, there is an unbound drawing by Edison of a meter, dated April 1898.

Much of the correspondence from the 1890s, included in the Document File Series, concerns personal and family matters. An 1891 letter to Edison from Friedrich A. Krupp of Krupp Munition Works, describes an arrangement of writing table implements that Krupp had sent as a gift to Edison. Two letters from 1898 pertain to Thomas A. Edison, Jr., and his business activities, Other correspondence from 1898 relates to Mina Miller Edison's brother, Theodore Miller, and his death while serving with the Rough Riders in Cuba during the Spanish-American War. In addition, there is an 1898 earnings report for the Edison Electric Illuminating Co.

Among the other items from the 1890s are unbound clippings from the Century Magazine and the Weekly Tribune of Port Huron, Michigan. "Edison's Invention of the Kineto-Phonograph" by William K. L. Dickson and Antonia Dickson, published in the June 1894 issue of Century Magazine, traces Edison's early efforts to simultaneously record and reproduce both motion and sound. The Weekly Tribune article, written by George P. Lathrop in February 1895, is an account of the life of Edison's father. Samuel Edison. 1r.

Three scrapbooks kept by Edison associate Charles Batchelor can be found in the Special Collections Series. They cover the periods 1890-1894, 1880-1896, and 1901-1914. Included are newspaper profiles and interviews with Edison, along with clippings about electric lighting, ore separation, x-ray experiments, aerial navigation, high-speed locomotives, new uses for the automobile, and a variety of other subjects.

# NOTEBOOK SERIES

## Notebooks by Edison

N-02-02-10 (ca. 1895-1902) N-02-10-10 (ca. 1895-1902)

### Pocket Notebooks

D-98-15

PN-Undated.18 (ca. 1885)

Unbound Notes and Drawings (1881, 1898)

Oversize Notes and Drawings (1880, ca. 1882-1884, ca. 1887-1898) fillmed with other oversize material on reel 1797

### DOCUMENT FILE SERIES

D-78-21	Electric Light - Foreign
D-80-04	Edison, T.A General
D-81-04	Edison, T.A General
D-81-22	Electric Light - Edison Electric Illuminating Company of New York
D-81-26	Electric Light - Edison Electric Light Company
D-81-33	Electric Light - Foreign - United Kingdom
D-82-39	Electric Light - Foreign - United Kingdom - General
D-84-13	Edison, T.A Employment
D-85-10	Edison, T.A Book and Journal Orders
D-86-39	Telegraph
D-91-02	Edison, T.A General
D-91-33	Glenmont
D-92-26	Electric Light - Foreign
D-93-02	Edison, T.A General
D-98-06	Edison, T.A Family - General
D-98-07	Edison, T.A Family - Edison, T.A., Jr.

Electric Light - Edison Electric Illuminating Company of New York

# LEGAL SERIES

Miscellaneous Legal File (1888)

SCRAPBOOK SERIES

Scrapbook, Cat. 116,993 (1884, 1896, 1909)

UNBOUND CLIPPINGS SERIES

Clippings (1894-1895)

COMPANY RECORD SERIES
NEW JERSEY AND PENNSYLVANIA CONCENTRATING WORKS

Plant Operations Records (1891-1903)

SPECIAL COLLECTIONS SERIES CHARLES BATCHELOR COLLECTION

Scrapbooks

Scrapbook, Cat. 1346 (1890-1894)

Scrapbook, Cat. 1246 (1890-1896)

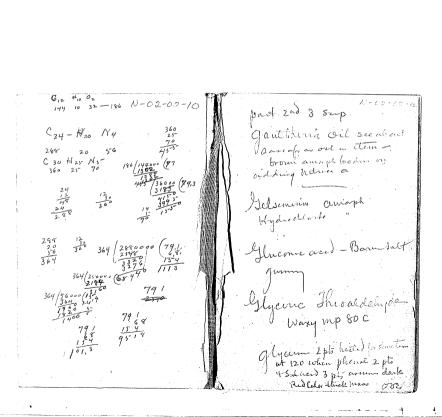
Scrapbook, Cat. 1328 (1901-1914)

# SUPPLEMENT

**NOTEBOOK SERIES** 

#### Notebook, N-02-02-10

This notebook was probably begun in the late 1890s, although the only dated entry is from 1902. All of the entries are by Edison. At the beginning of the book is a list of chemical compounds and their properties. Some of the compounds are indicated for possible use in squirted filaments or fluorescence experiments. The list also contains many references to Henry Watts's multivolume Dictionary of Chemistry. Another set of entries, bearing the title "Phenomenon of the Lamp," pertains to tests of incandescent lamps. Included are measurements of carbon buildup, along with notations regarding the amount of current running through the lamp wires, the duration of burning, and vacuum levels within the bulbs. Some of the experiments are on lamps with platinum or bamboo filaments. There are also entries labeled "Theory No. 1," in which Edison considers why certain lamps, including those with hambon filaments, are breaking. In addition, there are several drawings of railroad cars, conveyor systems, and rock crushers relating either to the ore milling plant at Ogden, New Jersey, or to the cement plant at Stewartsville. The one dated entry is from November 1902 and involves chemical solutions for storage batteries. The pages are unnumbered, and several pages have been removed from the book. Approximately 100 pages have been used.



- -

do in ag then ACl theres down a coloning moller. Chloro bromby dring Mircunothioglycollic aced see glycollic aced Pla Salt amph Hysolt do Cuprosolhio glycallicand Phonyl-Theoglycallic acid By PB Salt amosph harden mp 60. Cu Salt anniple Chromic do

gly oxaline or Hydroche Let ago he ale long time salts african Entroph. Tribromogly oxalenic a with Frepluby dioceanic

glyoxyl-Cartamide glyoxylic acid

See Dephenyl-grandine Hy Telrapheny (-quandino Dicyanohelolyf-guenikine quen cather des in bording sal O So deun Stanitt, + Cellulon pp by adding thele. Haptore aced Ko normal Salt amorph Nasact a Willy. See table 1023

Hesperidene see Hyrchlorethane, see-Homocoreatino DIV See Hierare and CP - 1043,4 2nd pt 300 Sup Diagory Bryone and delydrag gives alt whole product as, humino Aub - I hind the but didn't work well-See unfu Huma descrove Tolyl-hydantoro Ceci BUUM -

Throhydantoicacid Diom Phenyl-diethylazonium Gramile Phenyl-hydraz me Phanyl-Thio can bas by slowfuling DWM of 75-C See Depheny f- Theo carbazido -Diphenyl This semi cartageds like many All deravitive of Shows at XIOC & strangest

See \$ 1066 - 4 line - 2nd pt 3rd sup Amido devatures of Isatin - with TIN3 scaled tubo a Nesm Beory unido-di vsalin. amaph Amaric acid, Resm - colores. Sem. [11] of 1000 Brownsub- Ethylisopropy P Kestone with John leat -1130 middle of prope Suborone dulchalmaf suber and leaves tarry

Kosin-fit. Laurocerasin - auryoli Lepid in - Dichlordepeden etc -amorph - Oxykepon - Reson to see notich onderwatur of Lepedin -quatura Reserva Zrazofeucantino Charle amidocapiore andigorides-Levulinic acid Barumsalt

Lotur back contains 3 alkalond, one Lotweine in delate acido shibits fluorescence brighter than amountablet Farmall ophologistings of Laturine amoph - The other 2 alkaloids also give some (mugh Malicación askalisatt of Inactive Malie and amongs. All the dolls of Promatic acce one ample Phydroxymuloid ac) Calcium sait amorph Manuele or manital from product, heating 3 hours with wald

Materia ació - see Melisnic and - Ethir michisoniti waxyman Inp 73. Mercuric Lo Late aunph. Methacrylic acid in funny hydramic acid 9 in Red root industry fine tax loft unelate. Masso Tifley DElaune TG Courriers Sec p 1305 Methylamin

Melhy 1 - wobuly 1 - objecus acre See - Myricyf alcohal My ney? Hydrosil phide Nitroporaphthon black Hydroxy-a naphlha quinone Sout & Cick sus

Mitroheforoxy-a-naishthagunung Narceine, amoski W bushed costs Limited to be was or semant of form of morph for Ademiny No in pyrolites Amole sed Nickel 1389 Witnesacotanille see fits Octore acids Lead acidah amoph &f Isoclyf-phosphere - wax Charthylic acid or normal Hapitoric acid see

part relatingto andovenanthylic acid- Detrill good See Oxidalin-oil Valetile Espelly Tupenhi block sub-Mitroorcinal healed soon Swin Valor Tetronde somm deficit Broken on gur comorph pp with heavy

Oxysoumarin Oxy caproic acid ag Zn cd Oxypropyllinger acc Oxyuvitic acco DCUM Parabanic and SOUTH netromethane, age notes · dulenio & Callon seperals out See Nilropenfunic efit a saled might be squally then poet in letty

Phenal Ethan O-Ving Paussil Trans Varion Anudophends. when orther and court bleady powder or better Xa Consequede an amost hama body of Comes Francedo plonal - sic. Bromedochromagen Devil 100) Deven Gelow 100 1523 30

Metro phenal turn. Sown as see attack second things -Methyl cymendsulphonic acid Phenylawine and Salts nitregamont Phenyl-Ketmes. passage Chlorine block wass-1565 Phend-phehalidein auges arrigh - may be god fet

Fluorescein heald habyont + Zone dust. Sal breams California - of adding and & shaling with The dr disalaes & Dries upto Trans Van Monoresorcenal-pllhalcin-BUTH Blooky of luorescen why be good base Orcinal-phchaleingood fit. Evidently the phlhaleens can bounding Shiolerephthatic and Dom Terephlhalic aldehydo on many it alcoh she with aleolinisal Kody amoph-hip!

Phthalide Conaction by Pincho and healed will Podocarpicació mp 187 nesaled for to amaplious a-Dichlordpropronitielaction chloring on propositive brown ample products y an oproprome aced Rosalt Fram sale & Wagnes

animph brittle Sufices los

Pseudocontine valled 6 and Psendacoune salt all dungs Sitengoyl-apoperdaemin Acelifapoaconilise all mets Hydroxy sorbic acid 1703 3) Ba Ca Ca sacc comph Pyroracomic Monoranbanudo -See Nelropyraracomo Carbamale

See attach 1720 action heat on pyrwil- DWM good Ususymolorente to glutanic acid - mp 73 clian Jamapa - 1723 Triacetognercital, amopt han do pellacelo querestal Ckloremedoguenare readily decomp by Kohyorate or strong H2 Sox-humas -Mitramlie and Devm 1741

important reaction one Dintrosorcoorcanal sal Diethyl-resorcyl-ackelingke Pl sact amorph Rosorcingloxide amount

Aresorcinyl-dioxide amoph Hy drocy anorosamin 12 WM - 17.62 alcoholic Sal Santonini Exposed sunlight, amough Sebacic acid Ca sactamonph Hy salt do

Selic Ether Methyl Schale Wax Sificio benzoic anhiparido des Elta, Coon for Gits Sec Silicis Talettrichtorde Simistria amount Staphisagrine alumph Strychnine uclem butura aurigh body

Sulpholatyric ace Pb sactamaph p 1859 - XVI pp Hydroxyldi nophchyldiagensulphonicaed Webru leurs vang deffent Combulable Ca Telracelyl-Confering Tetralerebenthene, amoph brittle Saled resemble Colophany

Theofengaldohogde -Directiololiene beated with Saden amso gar Gulds block amaphenass Bromopanalolardine-Melasity De bromo rhololardenic -para

Oftomonololylansinic and On formalien of block legand rece of 5% sal not with Callande plater and govertel Carban Mullot, Compt (con)-XC 611 Chem Soc grund XXXVIII 482 Veratrum alkaloide p 2099 - dot amage Warned Zinckylidate Exhibits was plackingly was thou a directing were a cold than du 30 parts at 100 C

See andene blacks p 89 3rd Sup Secretary which give block ample Sub. psky Dean -

Dramed objugencoulphonic ac Dibromondamiko bengonasil Tribromom elamidoben zensulphonicació Durm Tetrabrom amido Genzenesul phonic cicid See amide last king 243 Dury See 248 - Chlorido - Divin

Azorybenzoic Scrwhali ailed

pt 1 3rd Sup

9 leave noon to fund h

Phenomenon of the hamp. Lamp brot up very high on pump so as to is little higher - phly because don't Carbons of lampblock with larry ide home very bittle life -

Electrical Carrying current one test showed lamp howing muti strong burned go hours gave 17/c "Contral whice connected to sound 4.54 amp had Vac broken & + Pivne can work Dounder reschausted, Cp still 17 no Coment when Central wire but amp . -53 - The play Connected to N wire -Ohen resideral goo was sufferent Strength Count marcase as accumulated to make a Color Cp None of Red of above value -Curutes variable as shown by unreliability of could Valt the flating wine Neg side gets block in time where it udicata Exputs a pad of tin foil on outside game through glass seal glabe formeded to gal & other and to P were forces Sometimes there are spots on Continuon Current, globes which are not blacken The Canying Count don't go around a Corner, a 16 cplange having apparance good vue youtdown for 3 pry hours to very dull red apparely looks Vac

328 36000 121 (96000

ş .... •

•

٠

C20 410 07

12

16

240 /1

362 (24000

Brugung a lamp up high on plenty of Aydrogen in lange pumps makes fel difficult to free of other gases gives oxider when put in flame it on a Copper Clamp acceptate also prevents too great drap Copper -CP - + probably lengther life although latter not fils which oxidize in flame in of sec are sometime better Dome Lamps have long lefe m cp & layer life than those which do not ether short, Lumps cought before they break shows bright 0xdys - 75- section, hence apot + when more reals gradual reduction in 5134 Un uno Croteria fil healing to spot is seen all rough - Barra This is a lamp which after dur toglichent Cany bung go hours was Concentrated There we which with reduced from 38 Cp to 17 radidual goon rapidly gars when put in new globe 22 do the work which is accelerated by dimention of surface R + Cp - showing loss by blacken rupo man flempula

yst this process failed after What started it at this particular a while from Courses point is unlenoun - porouly unterown - months of peculiarity of surface or Exputy Conedut got it original dimmshed diameter of broke at was abandon higher R of which the spot The only change that could have deconned for it was the apex was that the Bamboo was No matter how a lamp s shipped from Japan from a made, washed with H, Cl, different source or was Nor other good, globa healed difficulty or that Clamphetted the spectrosique Change in principal whey ded shows CO + Hay spectrum above all others, Low Vac with houging bluen P clamp globeldant blacken clamp get sooty, lefe poor, with titell higher Bambofels have 3 limes thelife If after half Cloud they are draped in You me side fil block asphilt of mally. alher site salving

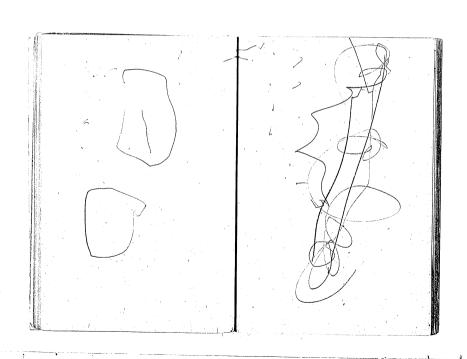
Upton remembers when Lamps Toomuch clamp were or were coming bad we washed Surface dimushor life of The globes desults were minum good then some change look place are couldn't get good results although ever washed are formeasily fopa Coil flashes, ale used around a during = them -Duplicate fils one set that to Lamp fred for Exhaus Com with Bamboo, 10 cp file never lasted as Long as 16 one Ex Lab - Lab was generall 50% + sometimes twice -Life is poor on Zuchcellulose Cons good, sometime Lampford when 200 Valto - of I would was Gast, of God of cut to 100 Valle sheet on other places than where Groke - dark spots as

also notice gradual laper Exputs show outside of towards break -1/2 mili blackeng of globe most Carbon pitted @ at pout from Change Cp due to change the break where flowsh was R un Carbon bright were round pits just 1/4 of 1/1000 surfuce rendered non as if a disc of flash Carbon conducting would account for drop CP by change Rflew out, Aylsweth songs must 43 delnt blocken globe give high findeathering yet there was great change our Comes out a Vacuum Res contom - is it when ! fil was block but where ded Carbon go 7 Notice most of 50 V Lamps rusofm ny Carbons ok are but off platura wire -When globe is blue & blue hato gones from clamps dis appears - now this could

only take place by higher In Chy a fil full of ash nearly Vacuum - couldn't be heat of all of it goes away in Cby farmace this can only lake globe as change somelime Utation hours Cant 62 Hg place after red heat house myny to Contin - aftermap funders not sufferent to as 9 understand of occurs on mechanical pumps Chlorine Vapor rum into Lamp reduce the ask it goes into stops blue = blue gwz fil - Lump of dworked Spec of Hg 4-60, high Cp CO will be produced If higher Vac gas must be of K then coquetallie absorbed somehow, K produced The black on globe com With ordinay run of damps be loosened by hot Hel the is no particular spot It cames aff in leafo where they brook as in as Heldow it best, what is break on P' as on IV side. reason this stuff Carbon

with Cope clamps no walter how durty they are cleaned Coy reducing action of Carrying account, not only P but the negative as well apiece of Cocoannet shell Chyd placed in Vac near loop dook brake grundly near the Charcoal, pbly water glass globs have affluoren Uply sola - or chart head wash with hat Hel best plly - then ruse distilled there is a constant brough 12d + man alcahal in afair =

When clamps get hat by bring up damp an pimp et weaks the tube from decomposing clampmaterial make makine of plago with 33 + digi as lamps having blue in globe Change aflemble oflerflicken Amay be Carbon deposited in glass may absorb the gases air mustalhereto by of pumps then fro



Themas solveny a fil is an oxidation the bitter it holds it Cp =

Moo 3rd 1902 Stange But Mix 2 grafite 6 Ni hydrati 2 Hgd- use for deply by 3 grafite 7 Non Butty Slowy? Valent acting upon the

3rd 1902 Storge Betty

2nd Jup See actioned - action of leaf with salingful sal KO The otorm breme flox spongy stuff - strong HCL decomp it = p 3+d tuff - strong HCL Brommeetine dark meit Brumsact amorph -See actionic and under acetine Letrachloro-diacitine cijanhijorini action Cyle in squetiend Decklorone block sub- 16 - " acetyl-fit, 18 Achillein - p 21 - 6 tille glassy Napellini p 23 Elistrio.

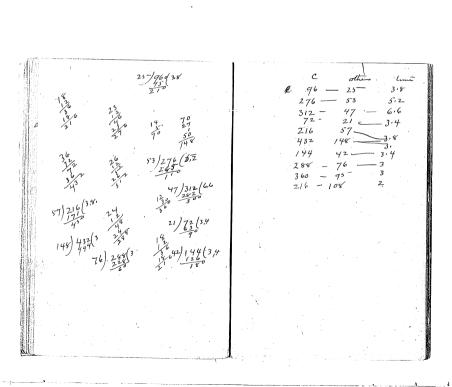
acriding - KoBishum Tox brown su aganic species sugar deid DUM - 30 Aldeheyder-sceneration with

Most poweful 0x3z:5al Vitic ackocklarate see p 69 - authoral is completed ox Bromme in agg pood oxedizarscep 70 See and flocks 75 Fits See Sulphone de af andireblu fits - p77 Arthrocene Orange 3rd my th 86 Anthruckogsoni fued with KO guris , worth pag

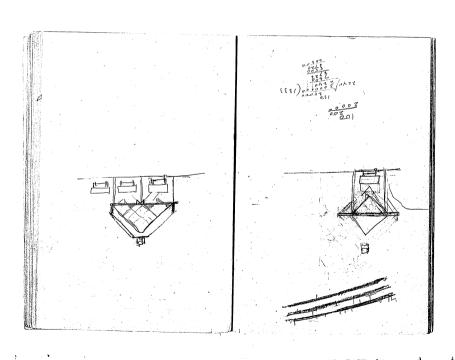
w treated cons For - 4 wal of Caryen (1) (1)

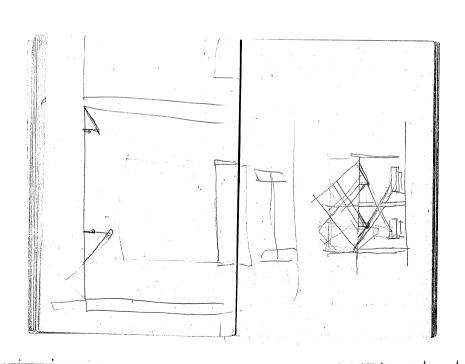
moderate Contract hours co bottom on 9 th trialed lamps notice Edmy 8th 9th Known that result 4th old bambos the house of laplace extend so for static compa all breaks ruens. Uhren 10th work from fibre met downer ho Known op oils a kompon sourch 14 Loige Cell films like Brits welk on Low Vac collen me secker

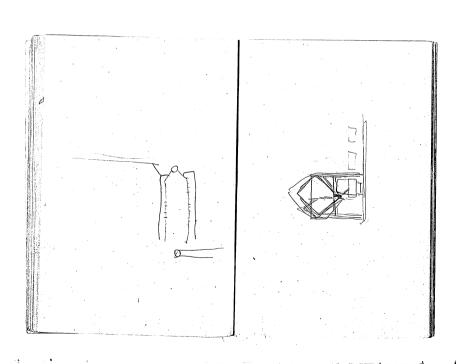
Not fil was poor on & Contos Carlon 50%) of Leposeed one had no



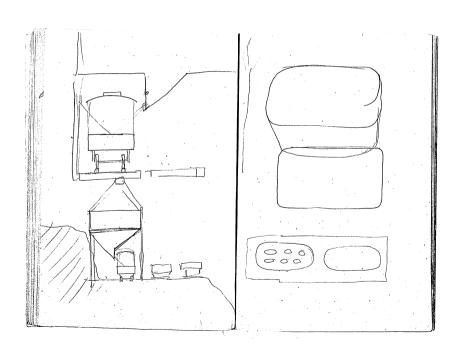
June Rendi 3.08 4109 0109 Structure atomics



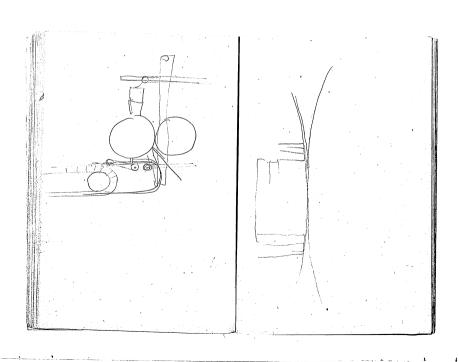


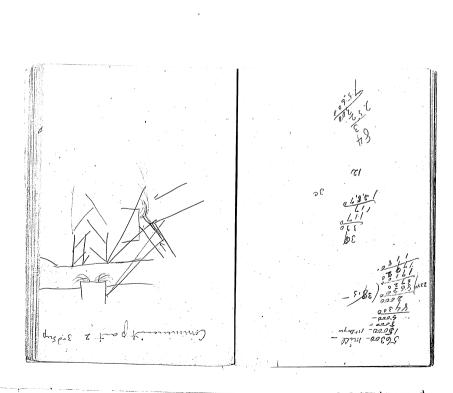


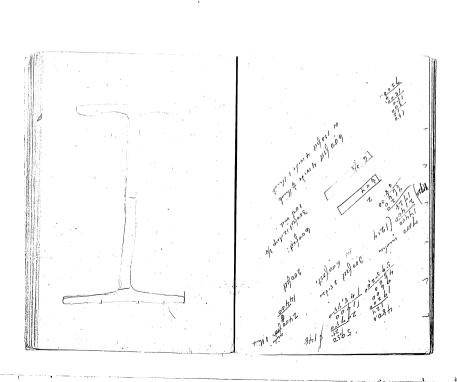
Bromstagettalessa in Vac Parapicolini. phonylotromio Amedobryonitril - mp Degoldelige at 94 Dramedotoluene has Ving tens in Vac of 75 min Amedo Fengy Leyanide phony propionital Andin - at 100 has Vaport of 50 Menaphelhylamine Nuphthatene at 100 a Naphthy lacedon tril 363 Tetrache Carbon at 100 B Diamikodephonyl 320 Depocative, periprolini, Brownaphthatene & 100 Ditaleplamine Xylidene CHM at 100 Quinolino CHN 106 Trioctylamine Phospho Andemony Privalelle at 153-Indine

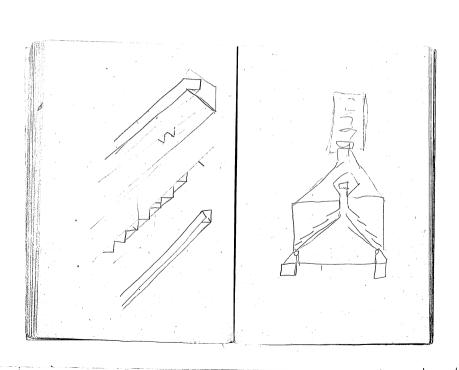


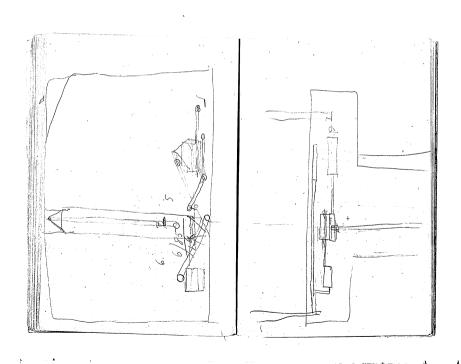
à

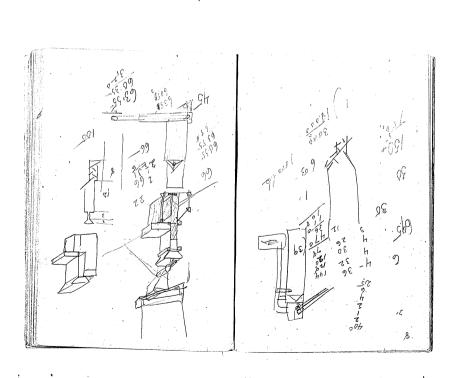


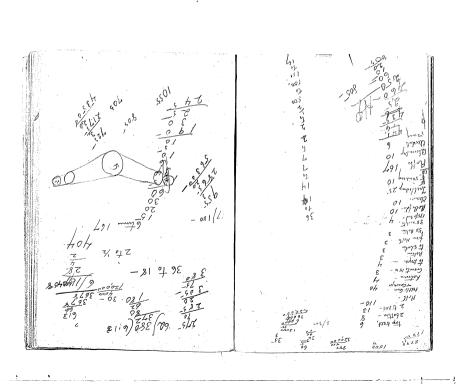


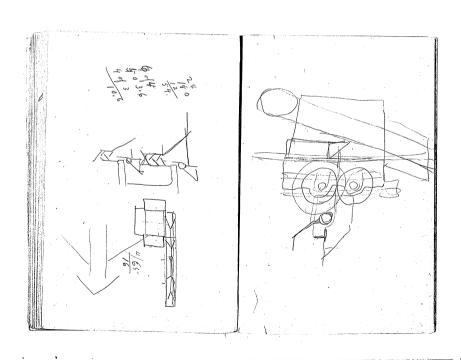


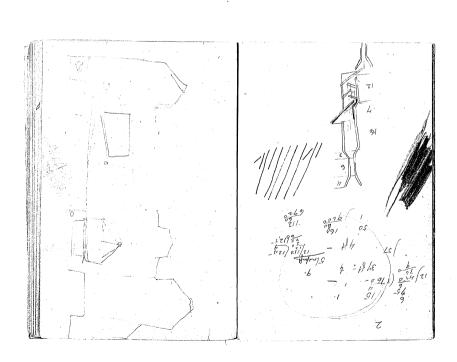


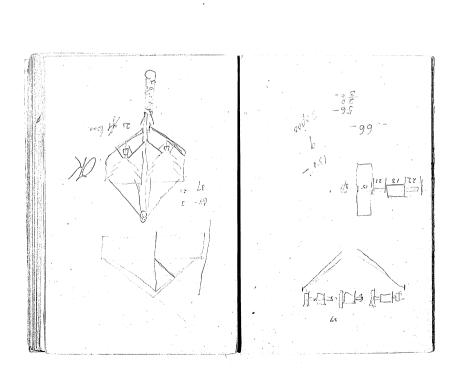


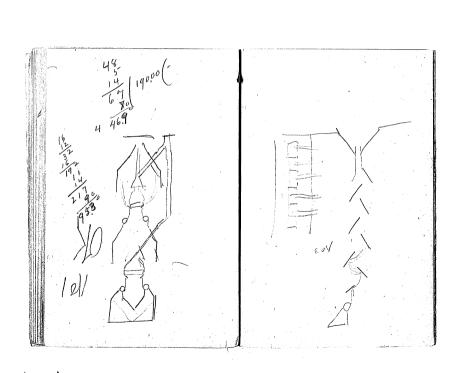


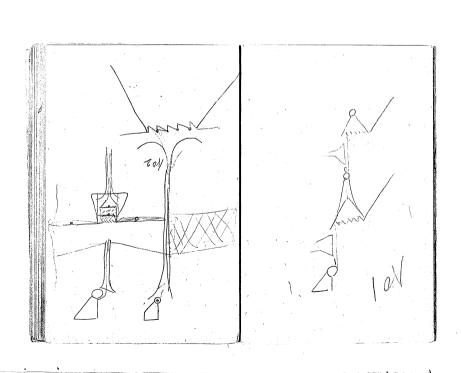


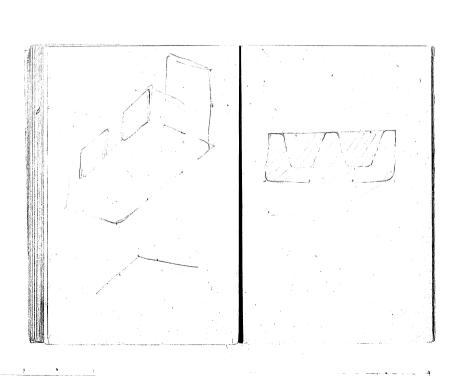


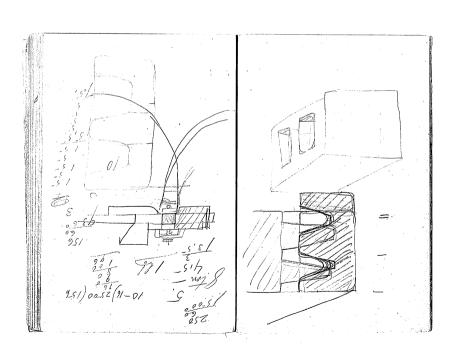


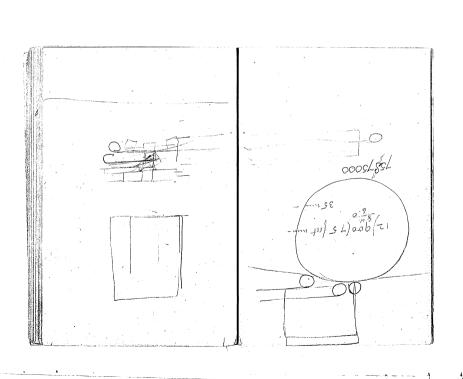


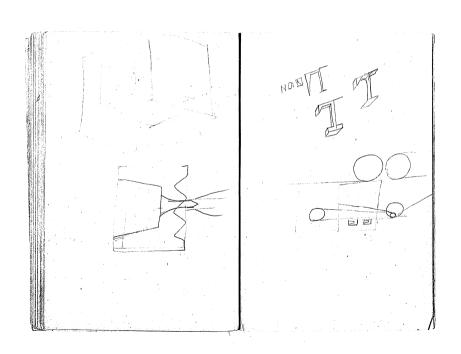


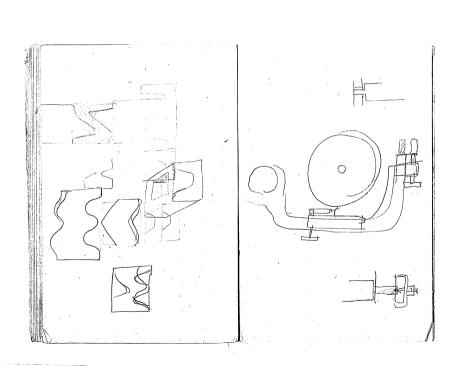


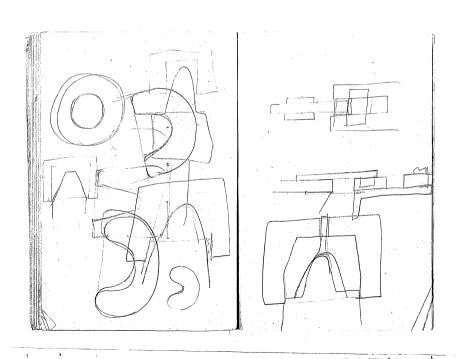


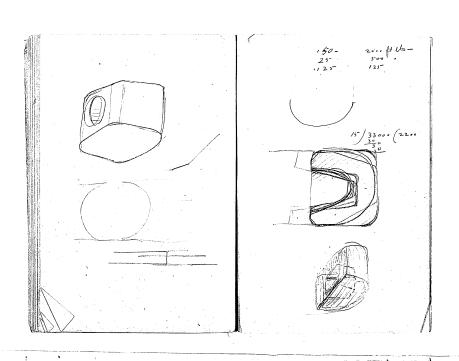


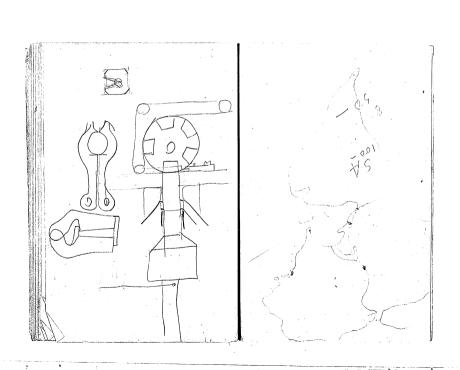


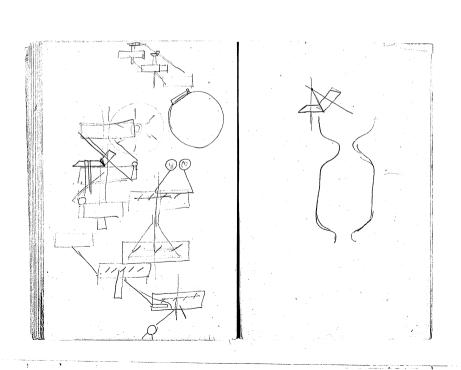


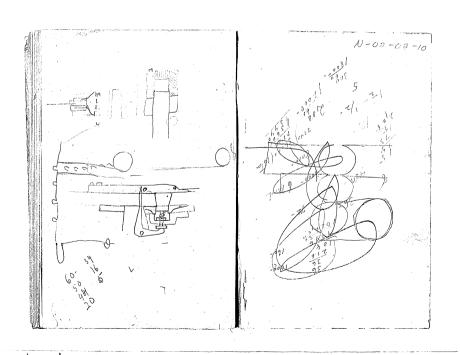






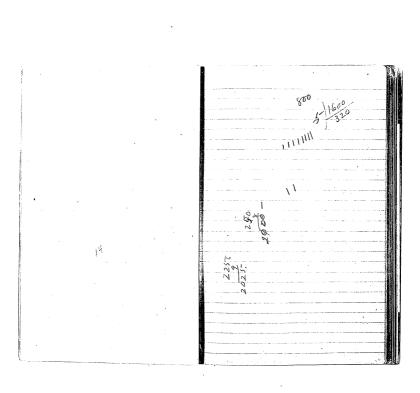






## Notebook, N-02-10-10

This notebook was probably begun in the late 1890s, although the only dated entry is from 1902. The entries are primarily by Edison. Most of the book consists of numbered entries relating to chemicals or chemical compounds being tested for either squirted filaments or insulation. These entries are most likely from October 1898 and contain a few notations by an unidentified experimenter. Also included is one page of notes on x-ray experiments, possibly from 1896. The one dated entry, from December 1902, is a brief note on a storage battery experiment. At the end of the book are a few drawings of ore milling equipment and phonographs, along with some miscellaneous calculations. The pages are unnumbered, and at least one page has been removed from the book. Approximately 60 pages have been used.



I noutation all part in front 144.

I noutation all part in front 144.

Not Syn 50 cc H0 50 cc NO3 10 grms syn.

None floats, fulfill all y families. Nº2 50 ecHO 50 cc HNO3 - 15 grms Syn Nº 3. 50 cc. HO 50 CCHNog - 20 grme syn.
Let helle Prous flere.
Duffe mail one lingth

	Nº4 50 ccHO 50cc HNO3 25 grma Syn
	bray small and brown floates
AND ADDRESS OF THE PARTY OF THE	for extender extender and partial puffe
The second secon	Sour se cont su och
and the state of t	The state of the s
The second secon	THE RESIDENCE AND ADDRESS OF SECURITION ADDRESS OF SECURITION ADDRESS OF SECURITION AND ADDRESS OF SECURITION ADDRES
and the second s	
	Nº5 50ccHO 50cc HNO3 30 grms syn
	and the second s
The second section of the second seco	The same and the s
mental and a second	
	· · · · · · · · · · · · · · · · · · ·
and the same of th	The state of the s
The second secon	NO 110 1100
· · · · · · · · · · · · · · · · · · ·	Nº 6 50 cc HO 50 cc HNO3 35 grms 54n
	The second section of the second seco
The state of the s	
1	

			NAG Foretto Facetto
			NO7 50 cc HO 50 cc HNO3 40 grms Syn
		<u>-</u>	and the state of the second of
			The second secon
		The state of the s	The second secon
4			A CONTRACTOR OF THE CONTRACTOR
		A contract to the contract of the con-	
			( ) , J.
			Nº8 50 cc HO 50 cc HNO3 45 grma Syn
		THE PERSON NAMED IN COLUMN	The second secon
			The second secon
			A CONTRACT OF THE CONTRACT OF
			garante de la companya del companya de la companya della companya
	TOTAL TO SELECT PROPERTY AND A SERVICE		
*			, +
			Nº 9 50 cc HO 50 cc HNO3 to gras syn
			or 9 social occurred so grade ogn
The second secon			
and the same of th			
<b>o</b>		1	
			* NOIA 50 40 50 UNA
The second section is a second			NOID 50 cc HO 50 cc HNO3 10 grmo selet Amer
The state of the s			Considerate fort bet must took
			6 bull by white out - abreal
			: Tot hat much then a yellow
			West - Vist and Line
			1 1 C 242 1 1 3
The second secon			party to the order of the same
		Contract of the Contract of th	■ *** **** * * * * * * * * * * * * * *

à,

y . \*

	NOII 50 cell 0 soccHNO3 15 grms selected Amen
 N. A. C.	J. J
 about 1997 March 1997	The second secon
 A STATE OF THE PARTY OF THE PAR	 /
 	 At a second seco
	 The second secon
 and the second s	The second secon
 per security of the contract o	The state of the s
AND THE RESERVE OF THE PARTY OF	NO12 50ccH050ccHNO3 5 grans school Amen Brech and free also were her perfect to be a form of the school of the sch
 and the state of t	 Tred ant 11 1
	 10.11 T
 	 Little revisions on his and
 The second second of the second second second	 The second secon
	 The second secon
 	 CONTROL OF THE CONTROL OF THE CONTRO
	The second secon
 	 1000 0000000000000000000000000000000000
 	 NO13 50 CC HO 50 CCHNO, 20 Tome selected Amon
 and the second of the second o	
 	 and the second s
 	 Commence of the commence of th
 4	
	Y

•

NO14 SOCCHOSOCCHNO, BOTH 16 Blank NOIT 50 cc Ha 50 HNO3 } 1 10 5yn : puffemuch

Nº19- 50 00 HO 50 HNO3) Nº 20 50 cc HO 50 cc HNO3 10 Hef 10 HO 10 NO22 Samesa 20 20 grows Sopa Constructs for the first in words for about for about the standard seek stoughoft profes to all my flower

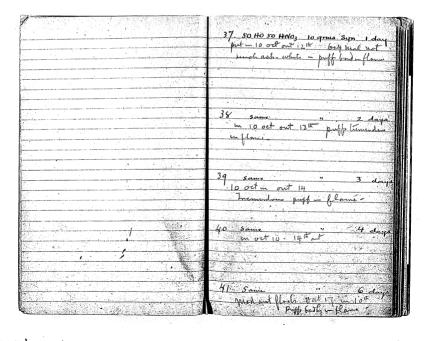
NO26 Same no 20 20 grows beforted steven

29 50ccHO 50ccHNO3 15 grano Prime Co

50 CCHO 50 CC HNO. . Nº 32 50 HO 50 HNO3 10 Hel 10 HO Wednessend of very well-only also No 33 Same as 32 15 grans Pri Rully of 19t. Don't boll Lot

A CANADA CONTRACTOR OF THE CON	
V 34 same as 32 20 grms Primo Cu.	
	1 · 343
5 50 cc HO 50 cc HNO3)	
10 Hel 10 HO 10 grus Primo Cu	
LO HSOY to HO	and the state of t
3334 12110 2	
	CONTRACTOR
Same as 35 20 gras Prime Co	
Same as 35 20 grus Prime Cu	
100	
Y	
74,	
:	

•



10 grus Syn 44 Sa th out 25

a apara ana bi

When would belle the pot whole of the follows the works of the pot whole of the pot the follows the whole of the follows the follows the whole of the follows the Come to top 1- peculia Decamp oh - Should Day H,O O- New Line of Exquito

again an 🕶 🖟 🔒

50 is rotten with white	51- gebruit 20 grains, 200 cc
ash - puffs some but not wall	
- practito by Met 9 reporty	Milant wet leafure trung Miles
This would show that Land	huyed aced a
Best Lump by will called	
than aco oluff used	I should form Very little ask
	about on Syn that less middle
Oct - Minday 000 24 11	n puffs auful-steethie physical pour 10
	a to a strain and a compatible
	ont octive and the Co
	about me in dry what had which or profit or the profit of profit or the
	infant of him - 52 - of days production
	53 Same 5 5
	53 Same as 51 but prime Cabine
, , , , , , , , , , , , , , , , , , , ,	
	1-54 Se CI
	drug sy out pet 22 grow 600
	La Campon - good
	Vary little agh rectish best of all the
	and the state of t
	Traday 21 put 53 in profuedal
	with about 25 cc of Hydrofluoris
	10 am
, 1 JAS ( ) 1	
3	
Januar Ja	

55 200 cc Her.

10 grms Chlorite K

30 grms gelsmit.

24 thoct 6 pm out 25 transtella Bry smill on dec Evilandy Gelsomit is different Sign has great did What ald Soy has great did What ask part out at 450 - clout pull brolithy none - than is so some all in flame - mal hat a 

most then had - other part lived Dry Kins had no title - tries any little Git in want Elfer + Chil 5 must be defined with the special section of the second better the second by the section of the or well hill pro the 3 quant to be not t 40 BL Sy wet with your w 100 ck Out water our 200 CCHCCCb-

. . . Les probability is 12 of a culture wint to a culture wint to a culture with a culture with a culture with a culture with a culture of mal -

				60 40 BSSy 4000 W	
			5,00	100000	YE IO
				20 Jan, Chliste K p.	11114
				150 HC8 CP -	
				19494	
			: -	The ach like 58 but	
				pull Blightly sale	-01
•				· little marken prouten !	gard.
	<del> </del>		- 11	make it of	- Hill
<u> </u>					
					7
25			7		7-1
		<u> </u>			7
					-
					7 3
<u> </u>					7.
<u> </u>					7.0
<u> </u>					1
		<u> </u>			36.
					-
<u> </u>					
W					
MA					(1)
200 /					77
SVEY.	- 1 - 2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	<u> </u>			115

-61 40 Sy BE 40 walnut to to 10 Chloritek powders)
50 BC Sur Stat walnut 150 PCC CD .

4 . . . .

65 200 Hel 10. Who Little warm wright logn 3 Du Thus 200 Hel wo H20 28 chele 40 Bhoy 66 300 HCl 100 H20 While Little warm 4

. + .

90 gms Bloi out some to lest, il 160 C 170 the onther

---

. . Showles greatly the Carolande inflam in Comes of 6 Ether takes out a great deal TELL sticks to it or it soften Atory thicky = puffers were from the 7 when med who che The Mal Reader seems Conta ن**و'** ہے ج

+ ...

68-400 CCWalin

100 CC CP Andreal

So gran Chloral K

ofter anti- neutralis So, HCl

to from Hydrochlande 19

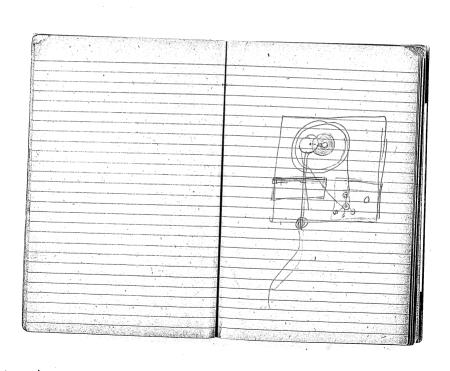
addes 200CC of HCl 5

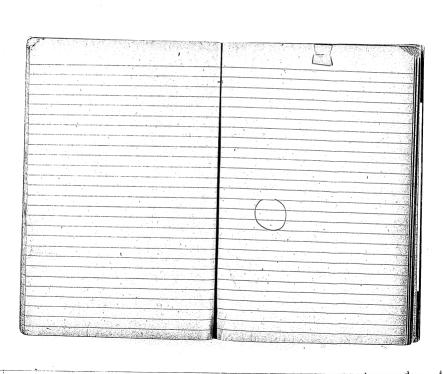
cock of Chlorati -4.0 t with Reg which I think Barrier de la Companya del Companya de la Companya del Companya de la Companya de

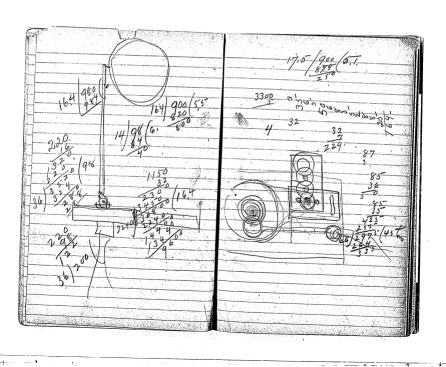
Old by Expost Ame

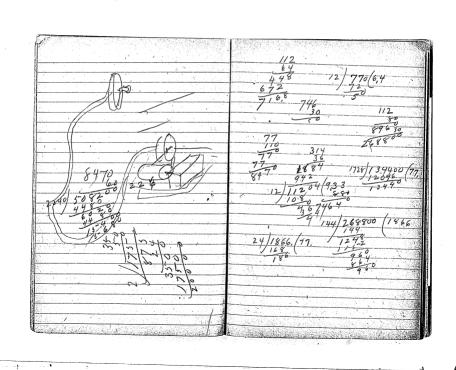
69 - Base probably be go 1 14 the 11 C

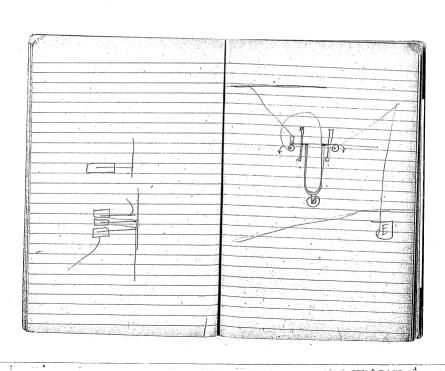
Bine Bosse -Included got whelet 0x120 6 Cornert from bolly them belt c

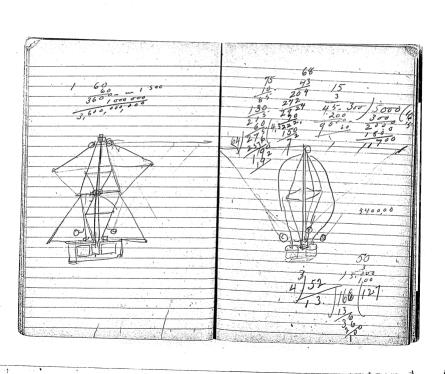


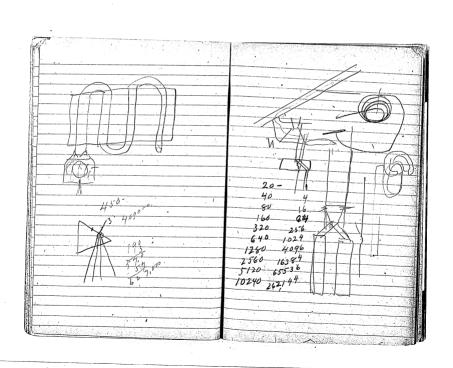




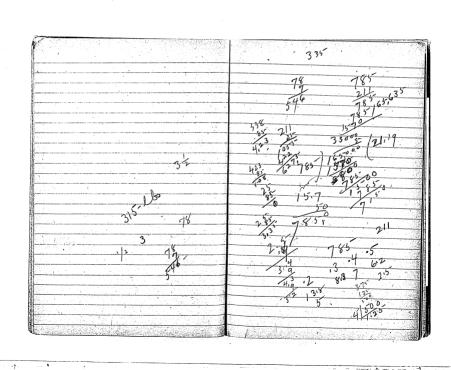


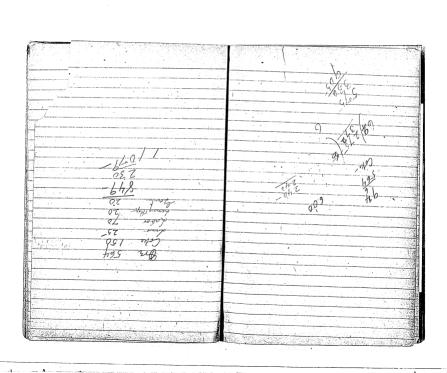






5000-7500 81 I phosphresco tim platine ay Ba + K, way of all the 50% fluories also - 000 Calloy = celet ystalo with idea that



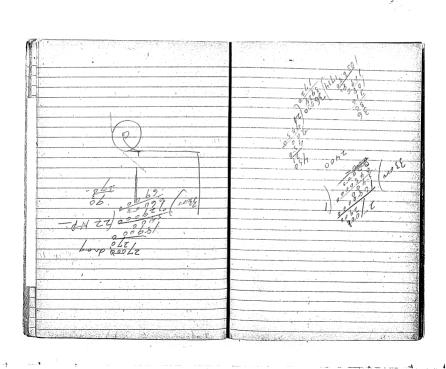


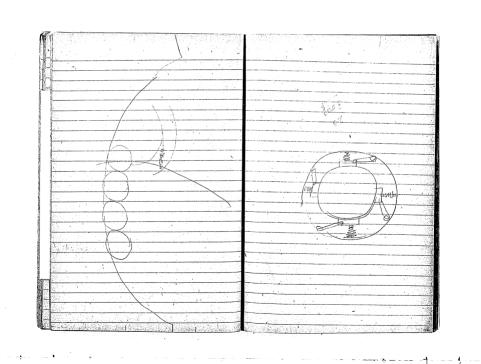
1111 25 Dec 1902

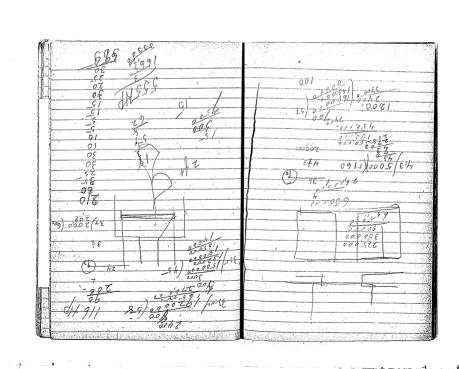
-945 20000 3/1 96 12 12

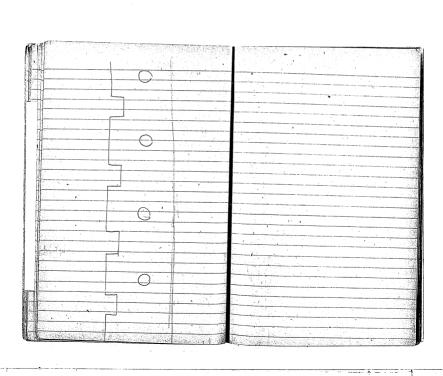
-+-

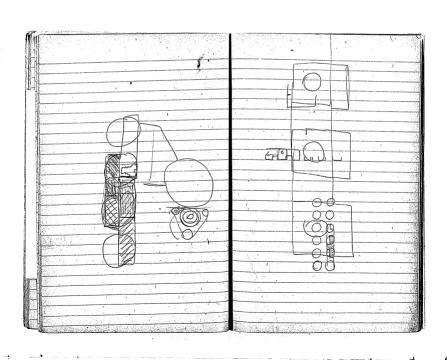
. . .

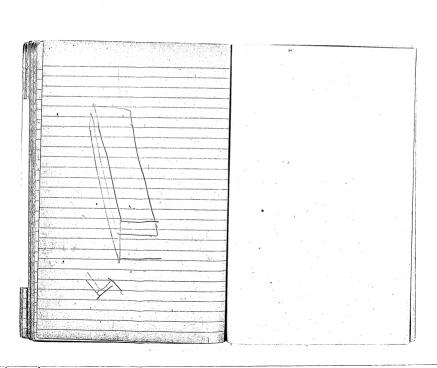




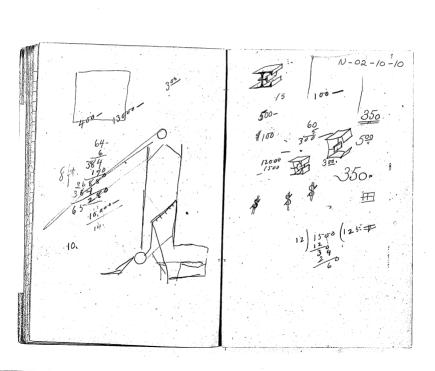








ı



### Pocket Notebook, PN-Undated.18

This undated pocket notebook was used by Edison, probably during the mid-1880s. It contains notes regarding chemical compounds and their reactions to heat. There are also two drawings and one page of miscellaneous calculations. The pages are unnumbered. Approximately 20 pages have been used.



Cate Brones Change Biones is

Borrhay - Cate School School



Hydronal moderates to hard hards with table to recting a state of the acknown of

Charactery Phos acres
demonstrated Silve & Prome
your hat he says
Of the same of the sale had
not be specified to the same
The specified to the same
The specified to the same
The same in a will have so
The same

,

Hulch 143 Rober Bangl
Butto 148 Me Colins 171)

Butto 148 Me Colins 171)

Tanden 140 1 Ht pound Don't

Refellite Colins 14 Result

Colons 137. With the pound Don't

Public Colins 14 Result

Colons 137. With the pound Don't

Public Colins 14 Result

Colons 137. With the pound Don't

Public Colins 14 Result

Don't Colons 14 Result

Don't Colo

Control of Surface State State

Control of Control of

Danist Leag Grate

processing of p

patie as in Struck

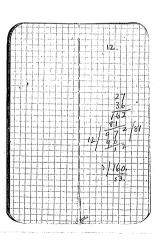
bfrok Sharing

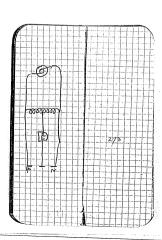
f as at Karlin

Stolking of League

Solicin Gentler

S

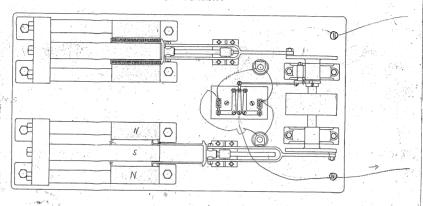


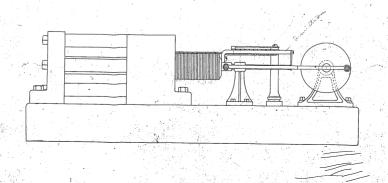


**UNBOUND NOTES AND DRAWINGS** 

1881, 1898

# Recipeocating Lynamo for Railwards Aug 28, 1881. J. A. Edison.





Phil 1998

# SUPPLEMENT

**DOCUMENT FILE SERIES** 

	Efferses Luly 17002	
	Lulyereer	
S.,	Thomas Alva Edison	
	Drivel Morgan & Combany	
	<u>and</u> = Egists I Sabhi and	
	Grovenov P. Sovrey, Trustin	
	<u>. Agrument</u>	
	Dated December 312 1818	
	10111	
	1 1 1 1 1 1	

[PHOTOCOPY]

Agreement entered into this mints fine day of Aromer cone thousand eight hund rid and scienty eight, between Thomas Mera bodison; of Mente Park in the State of Sour Josey, party of the first part; Deexel, Mergam and bompany, Banker, of the bity of Sice Virk, party of the second part, and Egiste P. Saltre and Erosvenee P. Louvey, hounafter called the Trustes, parties of the thered part:

Whereas the said Edison is the inventer of certain means for the development of electric currents and the application of the same to uses of illumination, power and heating, (which inventions are more particularly described in a cortain application for letters patent under the great seal of the United Kingdom of Great Britain and Sec. land, filed in the Patent Office at London on or about the day of October, 1875:) and is prosecuting studies and experiments with a view to the making of other inventions relating to the same general subjects; and is desirous of securing the aid and co-operation of said Drecel, Morgan and Company in Ataining similar letters patent forsuch inventions from time to time as they may be made and in the financial management, exhibition, and being ing out and disposition of all such inventions in

Great Britain and Ireland, the Chamel Islands, the Isla of Man and such other purious of

### [PHOTOCOPY]

Builish dominions as are or may be included in such letters patint; and is willing to give Drewel, Morgan and Company sole control of the same, and to allow them to retain as their compensation one half of all net proceeds, benefits or emoluments which may be obtained by them upon any and all sales or other disposition thereof:\_ And Whereas Drexel, Morgan and Comp. any are willing to undertake such financial man agement and control of Edison's said inventions in Great Britain and Ireland, to be exercised whonever they shall be developed to a practical success suitable in their opinion to justify offering them for general use or sale; and, in the mountaine, confiding in the skill and ability of said Edison, are willing to provide him the requisite means for obtaining and defending such letters patent, and for exhibiting said inventions on a proper scale, whenever in their judgment such an exhibition is desirable. And Whereas it is important that Drexel, Morgan and Company should be in a position of abolute security at all times, as to their ability to carry out all such engagements as they may make in the premises, against the revocation by death or atherwise of any power of attorney which might be given them by the said betison, and for this object. it is desirable to place the title to all said invention made a to be made, and all letters patent which may be obtained therefor in two persons, or the secrwiver of them, subject to the trusts and conditions herein stated.

### [PHOTOCOPY]

And Whereas the Trustees, being requested by both the other parties, are willing to serve for this. Now therefore it is agreed as follows: Tirst: Treact, Morgan and Company hereby agree to assume the financial management of the said inventions and all of them in Guat Britain and bre land, and all the other places above recited orefored to. To give their but efforts and employ the best means and agencies accessible to them to obtain for such inventions or the right to use the same the best price and most favorable terms: To reimburse the said Edison all sums hereto fore paid by him on account of the ap--plication for letters patent above refused to not ex-- ceeding On Thomand (1000) - dollars: To as sume and pay all further charges incurred or necessary to be incurred in respect to securing or defending letters patent for any invention relating to the general subject matter above described which may at any time hereafter be made by Edison, and generally to aid him in all suitable ways and by all necessary advances, during the period contemplated by this agreement, in obtaining the legal monopoly in said countries to use such invention and in exhibiting and disposing of the same to the best advantage. <u>Glecond</u>: The said ledison agrees to transfer by an instrument of equal date herewith all the right, tells and interest in his said inventions already made, to Regists I. Fabbri and Grosvenor P. Lowery a Fusters, upon the following treests and conditions: First, to

hold the same for the object and purposes of this

John to

[PHOTOCOPY]

contract, and from time to time by suitable act and deed to assign the same or any part thereof or privilege thereunder to such person or persons and in such manner as may be directed or appointed by Drexel, Morgan and Company: and in case Drexel, Morgan and Company shall have failed to dis--pose of the principal or controlling invention (being that upon which application for letters patent has\_ been made as above stated) within three years from the first day of July, one thousand eight hundred and seventy nine, then whon demand in writing of Edwar, served upon them at any time within six months from the expiration of such period, to reconvey the same to him subject to such outstanding licinses or partial or abolute assignments as may in the meantime have been made in good faith und er a direction or appointment by Drexel, Morgan and bompany, but otherwise free and clear of all claim and demands on the part of said Trustees or any persons clairning by, through, or under thom, <u>It</u> being the purpose of this provision to give Drex: el, Morgan and Company, for the period of three years from the first day of fully, one thousand eight hundred and seventy nine abolute power to dispose of, and assure a good title to, said inventions or any of them, when such terms, at such times, and in such manner as they may deem best for their jaint interest with Edison herein created; and, after the expiration of that period, to give to the said Edison, at any time within the six months above mentioned, and under the conditions above stated, the right to

resume exclusive control over the management and disposition of all inventions remaining undisposed of and thereby to terminate the power and interest of Drewel, Morgan and Company under this con-Third: The said Edison hereby assigns, transfer, and sets over to the Trustees, upon the trust herein.

-provided, all other inventions or improvements, made or to be made by him within the period of five (5) years ending fanuary first, one thousand eight hundred and eighty four, relating to the subject above described, to be held upon the like trusts and conditions; and agrees from time to time, as they are sufficiently complete for that purpose, to make to the Trustees special assignments of each separate invention, and to make pumps application for letters patent upon all such inventions; and upon the issue of letters patent, to as sign and deliver the same to the Trustees to be by them held a aforesaid; and further agrees to evecute and deliver all such other writings, whether powers of atterney, original conveyances or wintings

of further assurance as may be requisite to vest a complete title to each and every such invention in the Trustees as the same becomes capable of legal transfer; and further agrees to give concurrently herewith sole and irrevocable power of allowy with power of substitution authorizing and requiring the Thester in the name of said Edwar to grant license under and make any abolite or limited conveyance of any such invention made or empleted by him.

## 1878. Electric Light - Foreign (D-78-21)

[PHOTOCOPY] prior to January first, one thousand eight hundred and eighty four, and not specifically assigned to them for any cause, to persons appointed by Dreach, Morgan and Company who shall have become purchasers of any of the invention hereby contemplated; granting to such purchasers in respect to such new inventions the same or no greater estate, interest or right of use than that owned by them in the inventions original ly purchased.\_ Jourth: The Trustees hereby accept the trust imposed by this agreement and the instruments. cherein provided for; and agree to hold and convey the title of all said inventions subject and according Fifth: Inamuch as the sums of money which may be requisely under the stipulations of the first clause hereof cannot be presently ascertained, and Drevel, Morgan and Company are unwilling to bind themselves, without reserve, for the payment of indefinete sums, the utility of which cannot be foreseen, and Edison is unwilling to part absolutely with all power over his inventions and at the same time subject himself to the possibility of great loss and injury through misapprehension by Drexel, Morgan and bompany of the true value and importance of some particular inventions or of the whole of his sys tem as it may be completed; it is agreed, inrespect to all the advances or distursements herein provided (Sirit:) That the same are to be made at the

risk of the business and be repayable, with seven for

# 1878. Electric Light - Foreign (D-78-21)

cent, interest, out of the nit proceeds of the sale or disposition of said patents and are not to constitute in any other manner a debt or obligation of loctison (Second) - That Drexel Morgan and Company shall be the sole judges of the time, manner and degree of expense of such exhibition as shall be made in London or elsewhere in + frelan Great Britain (Third ! That whenever Drexel, Morgan and Company shall fail or refuse to advance the rums requirete to obtain or defend letters patent for any invention, it shall be at the option of Edison, within a time specified in a notice in writing to be served by him upon Drevel Morgan and Com pany and each of the Trustees - (and which shall not be less than two nor more than three months-) to require a reconveyance by the Trustees to him of all right, title and interest remaining in them in paid invention, or if in his opinion such invention is a necessary part of his general system, then to require in like manner a reconveyance of all his inventions then remain ing in the Trustees, and not sold or disposed of a agreed to be, in good fouth, by Drevel, Morgan and Company and after the giving of any such notice the interest of Dasgel, Morgan and Company in such invention or the proceeds thereof shall cease, But since the stipula. tion last foregoing is made only to secure todison. against loss and injury arising from the causes above mentioned, and not to give him that power in cases of

honest and intelligent difference as to what is a weeful or necessary expenditure in any particular case it is further provided that upon the receipt of any such notice, Drepet, Morgan and Company may, by whice to the Trustees and Edison, require an artification of three disintensted and qualified person upon the question whether their refuel to make such advances was justified, howing in view the interest of both parties as joint participants in the profits of sale as above provided; and upon the decision of such artitrators in fair of Drevel, Morgan and Company, the notice by Edison shall be held wild and of no effect. (Tourth ) - No cancellation of the interest of Drevel, Morgan and Company or termination of their control hereunder shall impair the obligation of any Emtract which they may, under the Sworth Carticle hereof, how entered into with the purchaser or intending purchaser of any existing invention in respect to the fellers inventions of Edison -Sixthy The expenses chargeable to and payable out of the joint account, shall be held to include whatever sums may be expended in applying for, Obtaining and defending at law letters patent for the paid inventions, The cost of exhibitions in England; the reasonable upenus of vaid Edison and a sistable allowance for his time should he be re--quind by Durel, Morgan and Company to visit longland, together with the commissions and ale other charges customarily incident to the promotion of companies or negotication of locurs in London but shall not be held to include any share

# 1878. Electric Light - Foreign (D-78-21)

or participation in this contract which Drivel Morgan and Company may deem it necessary or expedient to grant to other bankers, financial agents or associates; and all such share or participation will be deducted exclusively from the moity of Dreach Margan and Company \_ Seventh: Codism agrees concurrently herewith to constitute Treach, Margan and Company his atterneys in fact with power of substitution, in his name to sell and convey, and agree to sell and convey, to such persons as may be purchasers of any of his said inventions, a like interest in all fecture in eventions which may be made by or for which letters patent may be granted to him subsequent to the termination of the period of five years above mentan ed; the consideration therefor to be ascertained in case of failure by the purchasers to agree with Edison, by arktrators to be appointed by Edison and the punchaser in a manner similar to that hereinafter provided, it being the perfore of this clause to give Drewel, Morgan and bompany a means of assuring to the purchaser of any invention the title to which is invested or intended to become east ed in the Trustee hereunder, the option to acquire a like little or interest in and to all other inventions or letters patent made or issued after the fix years above mentioned; and to assure to the said Edison a fair means of determining the price to be paid therefor; and the price, when so ascertained, shall be payable to Dearl, Morgan and lompany and be duided equally between them and the said Edison, in

the case of all inventions for which they have advanced or fraid the expense, described in the Girst article hereof lighth: The term "prachaser" as used herein shall be deemed to include all presens who by as-

signment, license, or otherwise may acquire any interest on or right to use any of said inventions. The stand invention of shall be construed to include all discoveries, improvements and letter patent, issued

In all case of difference, arising between the partie under this agreement, the rame shall be determined by the Trustee, provided however, that either party may elect in any particular case, either before or within a reasonable period, after the decision of the Trustee, to call for an arbitation by three disinterested persons, and in that case each party shall have the right

to chow one, which ten shall chow a third, and the decision of such arbitaters upon any gustern submitted to them shall be final.

Ninth: The said Edwar agree, when reigewted by Dreach, Morgan and Company or the Treater, to execute separate instruments repeating the different corenoms and other-latins and powers of this agreement separately for more convenient use for filing a public

records, or for production in any legal proceeding where it is not desirable or necessary that the interest of the parties horsender shall be chain. This agreement shall brief the parties of the

first and second part, their respective assigns and personal representatives. In Witness whereof the parties herets have hireunts set their hand's and seals the day and

year first above written Sealed and delivered in the presence of Own Sora

Dreschlorgant to

Sec memerenden

tunered)

D.S.

Egiste F. Father Samuel Hovey

City and County of New York ss:

On this treaty eron day of July in the year 1899, before me personally come Egists I. Tellin and Grovener P. Lowry to me known to be two of the individuals described in and who executed the foregoing instrument and severally acknowledged to me that they widerductly

executed the same and for the perfores Therein mentioned and at the same time said Egish P. Falli, known to me to be on of the cobantous company the form of Devel Morgan and low-and brown to me to be the former are sentelpoint until the its new pa-forny, acknowledged to me that, as such copartous he executed the

and withwarst in the names and as the oct of said Drevel Jurgan our Company and for the purposes a foresaid Dan Degwow

abotary Rublic My.C.

## Her Britannic Majesty's Consulate General, New York,



I, EDWARD MORTIMER ARCHIBALD, Esq., COMPANION OF THE MOST HONORMAN ORDER OF THE BATH, HER BRITANNIC MAJESTYS CONSULGENERAL, FOR THE STATES OF NEW YORK, NEW JERSEY, CONNECTICIT, RHOOD ISLAND, AND DELAWARE

Bo hereby Cettify, Tjat I have reason to believe that the Signature subscribed and Scal affixed to the Ortificate hereunto annoxed, are the true Signature and Scal of Scal of

In Willies Whetref, I do beroute set my band and seal of Office at the CITY OF NEW YORK, this CLGALA day of March — in the year of our Lord, see thousand eight bundred and swooth Clightly ONL. Her has been sufficiently brunned, There has been sufficiently brunned.



<u>She jerigi</u> xwitiin and i

City and County of New York SS; On the 22 5 - day of July in the year 1879 before me came George W. Lover, subscribing witness to the fregang instrument, with whom I am personally acquainted, who being by me duly sum, said that he resided in the City of New York; that he was acquainted with Thomas A Edwar and know him to be the person described in and who executed the said instrument, and that he saw him execute and deliver the same - and that he acknowledged to him, the said Some, that he executed and delivered the same, and that he the said Form, therefor subscribed his name as a witness thereto My Co State of New York, City and Connly of New York.

City and Coming of New York, Fred Street, Court of the City and County of New York, and also Circk of the Supermen Court for the cent (10 pcm); the same being pCourt of Record, DO IRRITORY, That who assume is subscribed to the Certificate of the proof or application of the country of New York, and the country of New York, the City and Country of New York, develling in the said City, commissional country of New York, the City and Country of New York, develling in the said City, commissional country of New York, the City and Country of New York, develling in the said City, commissional country of New York, the City and Country of New York, develling in the said City, commissional country of New York, the City and Country of New York, develling in the said City, commissional country of New York, and the City and Country of New York, and also Country of Rever Advanced Country of Rever Section 2018, and Country of Rever Section 2018, and Country of Rever New York, and Country of Rever Section 2018, and Country of Rever S and sworn, and thely autonomes to time the same. And further, that I am well acqualated with the hand-ording of such Noting, and verify believe that the signature to the said certificate of proof or authorobedgement in genuine. I further Corify that sold Internant is accessed and or-hountedput according to the targe of the fund of the Tori.

It is a transfer to the second of the Toring of the Sold Court.

It is a sold Court of the Sold Court of the Toring of the Toring of the Sold Court of

## 1878. Electric Light - Foreign (D-78-21)

[PHOTOCOPY] The foregoing agreement contemplates the concurrent execution and delivery of 1. A special power by Edison to Dread, Margan and Company author sjing them to sell all his interest (equitable or loneficial) in existing and future inventions of the five year period, and letters poeting to b granted threen, and to agree with the peachaser of any invention that they are to have the title to all the like inventions made within survius year from date of foregoing agrument; subject however as to invention subsequent to July 1884 to a compensation to be fixed by auditralors. R. Town by Truster to Deexel Morgan and Company, authorizing them be dispose of Structus' virterest (light title), and engaging to make over such little as is in them from time to time to Dreecel, Magan and Company's appainters, and agreeing to exercise the power of atterney given by Edison to them under the last part of the Third article 3. Special assignment described in the Second article 4. Sower of attorney contemplated by the last clause of the Third

Whomas a Edward Shomas a Edward Color Shomas a Edward Color Shomas a Edward Color Shows to Show the Sh

1880. Edison , T. A. - General (D-80-04)

New Harmony, Indiana Dearly Knowing how ruy much your time is occupied show constantly you are besieged by Fullow + letters, brefaced the solutation of some friends here to address you. However at the urgent organs of W. Pelham, who owner operates the Telephone route belong this place sell-know, I rentine back for him tothers a few questions, which Ilpe canbe reddy answered without infringing to muchon your time. He is auxious to know whether gonare alus. prepared to dispose of Territory for your Election Light twhitter or not grawfuld sell oneir more of the Lewis, so that he could become families with the working of the appendix.

If hundredtine correlly he would have although the remain from the training a fafficiently bringly bringly

of wales the cause present ever during transfortion

battery; although he has a number of the granty-balling; while he are beforethe live was changed from the helping the beleftone system. Lovas connected for 15 years with the het etate Knimist, as Prof tat. Seiner shad the flexure of heing returns, with fine illustrative apparatus, from trop. Barker not before he metyon in Colorado. One four Profi, - J.a. loylie, of Plique, also met gon outlet occasion reloke of the pleasure he had in seeing your devices for obtaining the bet astronomical riew A. L. Before the mar in which I wan Ce. of an hat Regt. beide being State Enloyer of this State, after the death of my brother D. David Dale Orm State Evolugat of Ky whole, I had and 9 to years as Prof. of Nat. Se. in allile ally which finally became but of the Unimet of tachville, Iran. While there, I published a work on Ecology, a copy of which Itake the blackof reading you by today's mail. Mornighter wight of his the our minister touring Sentally tolly . v. Hambeldt that the plane of the categorph lites in rifly. While not fully admitting the whole generalization therein attempted, he askendelps many of the laws: as her strawen stones sotters have done since in their hablished work, Daring the 20 year which have since classed, although Therefound our tomodify some of the news, the mein laws have please for firmed. Irons thinky led A detect with the Galvanometer the direction sulities

thought of the to called curents of electricity is the carthi crust + proceeded of construct my electrical fobe, which shows with a small bichrometo of fotasso kell, all the yourse Chenomine of the declination + inclination of the weedle. Law still busy with or qual result in Terretial Magnetisia. weeking zon entire success, expecially in four present year problem of going the world abcastiful, cheap + scientific light, Hoping graning boy enjoy good health Apromote scientific discourg, buy truly yours

# 1881. Edison, T. A. - General (D-81-04)

T. A. EDISON.

OSTRIBATION.

Splin York 28 Missing |

Shory Beatly 29

Their Grant Vet to

Shory Ver

A have green kield

for a trans of the of the court

for a trans. If they of the out of

the of the Alberto Court of the court

are of the whole of liftener

The of the order of liftener

or particular I chart to

or particular I chart to

sely gear if gon will

ence writing the end of 25 8 with

## 1934. Electric Light - Edison Electric Illuminating Company of New York (D-91-22)

### [PHOTOGOPY)]

Memorandum of Agreement mode that twenty third day at March

in the year of our Lord, one thousand eight hundred and eighty one, by and between The Edison Electric Light Compuny, hereinafter culted the Light Compuny, terry of the first part, and The Edison Electric Hundinating Compuny of New York, hereinafter called the Illuminating Compuny, party of the second part, each being a compensation duty grantest under the larges of New York, Wignesseria;

Where the Light Company is by them of a critical contract, with Taiman A. Zajian, the owner for the Indiced States of certain visuable investions and Lether Barton (win investions of transp. Jajian, nor the United States, inviting references to the production and general distribution of electricity for flight, booth and power, and a colorist by work centract and the inventions of need 3D flows, reging to the same and jeed, for the same territory, becomes one, or which becomifer may be simile by Min, which the period of the youing room to work this opt of among 1981; and belodenous contacting with programable particle per the new of the said historiation in the among and to the cetter herefulner remediate, for, invertibilities, inclination quantities and the contraction of the said historiation in the among and to the cetter herefulner remediate, for, invertibilities, markets or present the City of New York, the or blinking the Coll Uny, as may be greatly appear; and

Wires the Hiministing Conjumy is a corporation object against do for the perion, manage afters, or deceiping from the Life Conjumy the first pick to use the soft histories of the side Disjon, in the City of New York, or in certain peta thereof, on afcroad, and in empide of mixing contracts, for pick-instance and purposes berieve for the china allowage over this Lifekt Congruery to present the instance, to not find not all near the confidence of the confidence are considered as a considered a

First. The Light Company hereby agrees to license to the Illuminating Company the solo and exclusive use in two certain stations, sections or parts of the City of New York, which are more particularly set forth in another part of this instrument, all the inventions and Letters Patent of Thomas A. Edison now belonging to the Light Company, or which may bereafter come into its possession within the period of five years from the twelfth day of January 1881, under and pursuant to two certain contracts heretofore executed between the Light Company and the said Edison bearing date respectively the fiftrenth day of Novcoher 1880, and the twelfth day of January 1881, reference to which is herein made; and the Light Commany agrees to execute and deliver to the Illuminating Company a license; in the form hereto annexed marked Echibit A, and such other or further license or licenses as the Hinnihating Company is entitled to under the terms of this agreement, accuring such sole and exclusive right of use, but ambled to all the conditions stated in this agreement, and also containing terms forbidding their assignment or transfer. It being the agreement of the parties hereto and the intention of this agreement, that this agreement shall not be in any way assignable or transferable by the Himilianting Company, and that my Hexuse which may be executed by the Light Company pursuant to this agreement shall not contain anything in any way whatever authorizing or empowering the Illuminating Company to make any assignment or transfer whatover of said licenses, or any part thereof, but only to make such sub-licenses to its customers as may be by such Reense permitted.

Secol. This agreement to license as alreavial does not authorito the sea by the Illumination. Company of any of the breactions of Thomas A. Disions in first a they relate to the propulsion of railistic time of the familiary of ever for millary trafficult antientees the new of mach breavities, and periods only so fir as they apply to the positionis and general districtions of evertriety for light and tord, also for prover for domestic and helicativity approach. It is further agreed that multile arrive, columns detail in any xive cutilite the Illienduckly Company to soo or to have any three-sh to a direction core the soo er control of the soft intervalences one form tells prove be not for the production and distribution of a festivities for light, beat and power on stemadoles, sufficient years because the sufficient of all indices, whether the same are neglected as of Ker Victor externish, the light Company beredy re-resign, exclusively the right to do at with all kinds of martine craft, both in tor Cyr of New York and elsewhere, as expands the raised discretions, with the sour-forces and decise at Ill bulgerowns.

That. The two sections, stallines or justs of the GUy of New York referred to in the flowing engagingly are as follows, +1: First, non-solution possessible possessible that is home per a fine (rity, of New York, bounded on the limit by the Rotel Riber, on the Word by the middle lim of years expenditure for New York per handled lim of symmetry and are in South by the middle lim of years and when the New York per handled lim of years are seen to the sound for the middle lim of years are seen, a station of storet the sound wave for the middle limit of years are seen to record the middle limit of years are seen to record the startles, but down the third handles was proposed to the particular points are twent to particular barries. This boundage of the solid Rist section may be evolve be noticed to any overall of convenience or commany or for other person persons, and so the limit for convenience or commany or for other person persons, of pass which the convenience of the Light Cumpus.

East. Whereas the Edward System of Electric Identity, referred to in this parameter, reco-dimentic modificating or breaking up of the zero of the City of New York that a large imagine of sections, or addition, to the number of about thirty-done before Securital System in sold City, but of a disk not above described; and whereas it is the binotion of the Light Grainput to become librage, the Illiminating Company to see the anal Elbons System in all the other sold sections or alluling of the City, provided the Illiminating Company shall exploit or infroduce the sold System in sold styles good and the View recommendating Company is seen than the City of Company and the City of City of the City of the City of the City of City

#### TPHOTOGOPY/I

the City of New York as observable, provided the Hamiltonian Company, if the Light Company that is also should be compared to the City of the City of

Pifth. The Himmuniting Company agrees to pay to the Light Company for the agreements, rights and life; or horsely, given, 35 per centum of all stock issued by the Bluminating Company, of which In per centure shall be paid to the Light Company in carsh, at the pur-of such stock, and 25 per centure in fully puld up stock; and it is hereby agreed that whenover the Hituminating Company shall issue any or all of its present stock, and as fast as it shall issue the same, and whenever it may be cuffer increase its stock and make issue of all or any part of said incresse, and as first as it shall issue the same, the Illiminating Company will pay to the Light Company a sum in money equal to 10 per centum of each and aff of said issues, and also issue to the Light Company 25 per centum fully paid of each and every issue of aforesaid, to the end that of every one hundred shares of stocklismed by the Illuminating Compa the Light Company shall be entitled to and shall receive 25 shares of said stock, fully publ, and in addit thereto; a sum of money equal to the pur value of ten of subbalances. Should the Illumi making issues of its stock permit payments thereon in Turshilments Instead of requiring payment in full at once, it is agreed that the Light Company shall accept. Its 10 per centum of each compensation above provided for, as fast as, and only as fast as, the said payments in installments shall be made, provided however, that in no event shall a subsequent issue of stock be made until the payments on all prior issues shall have been made in full, and provided further that whenever any issue of stock is made the Light Conquiry shall promptly and without any postponement, whatever receive its 25 per centum of fully puid stock of such issue, as above provided for,

Softs, Income in it is desirable the interest point periods incorporate that at the beginning of the introduction of the Boltum Better's Lighting System, and or some time therefore must be a light Gouppy and better who clinical, the proportions and installation of the plant required in not and every sendance attains who clinical the properties of the stabilities of the plant temporal of the control of the least Company, in order to instruce for the time being the bounds of all the experience of the Light Company, is only not some and employees. It is exceed that the Light Company and the solution of the Boltum Better in the Light Company, the first as recent and it is experience give orders for and ottain, portions and popularizes that may be recovery according to the Properties of the Company of the recovery according to the provisional and repredentment of the Light throughty for the complete programmed multiplication for the provisional and repredentment of the Light throughty for the complete programmed multiplication to the point required the multiplication of the principle of the control of the first invariance of the complete programmed multiplication of the principles of the control of the sections of such control of the control of the first invariance of the time Light Company, while may be expensed, and multiple acquaints of the District of the sections, and shall make men change for the sections, and shall make men the provision of the section of the secti

Screath. If at any time hereafter it shall, in the opluism of the Light Company, be for the benefit of both parties to this contract that the Huminating Company should give its own orders directly to mannfacturers, and should itself become a purchaser of plant, or my part thereof, it is agreed that the Light Company shall supply the Illuminating Company with all requisite drawings, specifications and model ( apleted and perfected so as to enable the Illuminating Company Itself to contract directly with manufacturers, and not through the intermediary of the Light Company for the manufacture of the requisite parts of a complete plant; but in such case it is agreed that no change whatever shall be made by the Illuminating Company in any parts of said System without the consent of the Light Company, and also thatthe Light Company shall, through its officers and engineers, have the right to supervise the manufacture, seto ting up and installation of any and all plants or parts thereof this obtained, to the end that no interference, or disturbance of the general System of Electric Lighting of the Light Company as the same is now perfected or as the same may be hereafter changed or improved in the fature, shall be made, but that the said System as a whole and in all its details shall be under the exclusive and entire control of the Light Company; and in no event shall the Hilministing Company ever use in any part of its plant, or in connection with any part of the System of Electric Lighting herein provided for, any machine, method, material or appliance, different from or additional to those furnished or authorized by the Light Company, without first obtaining its consent in writing. But it is further agreed that the Illuminating Company shall pay to the Light Company the actual cost of the services of engineers, draughtsmen, and other skilled labor required in making drawings as aforesaid, or in superintending the installation of plant as aforesaid, provided such charges shall be at the rates customarily paid for services of like character.

Eighth. At the present stage of development of the Elison Electric Lighting System it is impossible for the Light Company to state otherwise than approximately the cost of a dam for a section or sta-

## 1994. Electric Light - Editson Bestie Illuminating Company of New York (BERLEZ)).

#### TPHOTOGOPYI

the part is the bridges of the light Comparey, notice it and faith town, or the Illin part, and desiring see far as any bete afford in redvance every possible information, that the cost of the that for each of they two anchors mulations above, amodifically described, will be use follows the the court for the plant of what is called the descritown station; exclusive of a hubbling to be occupied for the believe. stem dynamos, or cotem, all lealout \$250,000, and the ost for the other, or up-town station, also excludge of sold builtfilling, will be don't the same amount. The lights of much included and appliances constituting each cloud plants and the cost of the same so far ass can now be foreseen by the Tide Common ways and both is detail in a making late house armount married Schools. No. 9 for the doubtours section, and market Scholale No. 3, for the up-town section; and it having been herein provided that the Light Company will get us agent of the Illuminating Company to give orders for numbers and my for the scaled plants it is broky newest a best the Diminisher Commany will be advance of civing saleplers deposit with the Licht Company they estimated cost of the same as fast as such densit shall bereguled by the Light Conguly, it being understood that the Light Company shall not exact from the Himmington Company as already larger a dynamic juggets on account of said plant from those to the tian in the best judgment of the Light Company may be accourse itself from loss in connectin with the sold proless. It is fether across that If the cost of the sold plants should accord the solutions as set forth in the schedule, or should any charge be made bereafter by the Light Courany, or unfor its direction, whereby the cost of such plants shall be increased, the illuminating Compair shall bear the est of such increase, and funish the money to pay for the same, precisely as if such increased est and such changes and modifications ind been originally set forth in this agreement, and in the scholate or scholules hereto apprexed.

Note. The cupital of the Huministing Company, which is now fixed at \$4,00,000, dail to defence of the intermediate third to ensemble the high Company is within any without the low-me of delivery to the high Company of the propriets of sold stocks together with the each payment as also probed for; to canding berefer, towards and also expended for; the canding berefer, towards and also provide the high Company from time to the office it which could be the sold to the time. It is a time in the canding berefer towards and also expended to the contract of the sold towards to do not, as to the high Company from time to the office it who lot or in part, should be care to do not, as to the high Company.

Tash. As ardellisionle responsible for the bessides ganted by Bib Institution to the Blushouling, Canque, it, is breedy agoed in the Himmhusting, Compay's Board of Direction shall alone seeked and insidered was health in suitated by the Light Compay, and shall be elected by the architecture of the Himmhusting, Compay, and its further agreed that use of these two directors, to be deplaced seek the Light Compay from these than as if many think let, shall draps be an anemate of the Baundell or Executive Committee and of all other committees of sold Board of Direction of the Blumbudge General.

Account. The Hammung domping shall anothering lie prepriy or neverous up very ser note that the changes of the light change. We there even put invested from their to their interessor that make or oscillone or station, and to occupy and epigh for some set of money shall be presently be reproduced to the change of the change of the final property of the change of the final property for shall property by single countries go of the final natural of Comparing which the be obtained or their bearings or the final natural of Comparing for shall purpose, without the written owered of the 1504 tonours.

Topidy. The Illimitude (onjugar shall on the field sips of immary and July of only part series, make a full report, rotfielly onthe of the officer loss equalisate with the shealth projecting to ten give in solar propert, of the isloss of the Corapuny feel near providing six months, and the Light. Company shall have the right is presedle a forms or forms from the rotes; and the Light Gaugary shall have the right is presented into any law ratherties; at an and Private or a Review from the rote of the remaining the remaining of the control of the Corac and Private or Review Committees, the control of the Corac and Private or Review for the Corac shall not demand of the Light Gaugary shall be considered and the Corac and the Corac and the Corac shall not demand of the Light Gaugary and the factor shall not demand of the Light Gaugary and committee the Private Review of the Corac and the Co

Tableconds. The Himborthy Coopers what I incipationies are piction affecting the Dienst picture of Borth Lighting. In any of to deaths whether were present to the picture of the set of all Its Dienster, of the temperature of the picture of picture of

Forterion. The Humaniza Company ragrees that is functioning High, beat and power to settle connects, it will seast from those down cloud titions described on pieces the Light Company any sequence. Figured, The Humaniza Company and the automotive described on the Light Company, and the Lights Petron to include cells from our beathermouse for controlled by the Light Company, and the invidey and still got the incentions therein described and exhaust and agreement it will find it may up white or distinger contracts charter the still got ong or of the printed that may be Horogoset to we generant to this agreement, or the satisficiency of the specification and pass the company of the printed that of the printed that pass is the satisfication of the satisfication of the contraction of the satisfication of the contraction of the satisfication of the contraction of the satisfication of any of them of after convenience of the satisfication of the contraction of the satisfication of the satisfication of the contraction of the satisfication of the satisfi

#### 1981. Electric Light - Edison Electric Illuminating Company of New York (D-91-22)

#### (PHOTOCOPY)

Microsis. The Jajak Company resums and receives is both for right to reservoirs and design and sales affecting the contility of the patients, on the University of the patients of the University of University of

Seminaria. In crea the Himbanding Computer prices or neglects to perform, or "wister any of the conflictions or provisions of this agreement, and neptivality may of the conflictions of the seminaria and neptivality may of the conflictions." In this case, the confliction of the c

Follows. It is naturally negreed by the particle streets, that this agreement provides only for it shows or eight to use the invariants and retires open for it which a naplice and themselizarily, summe, natural and other means and applicaces embedging and invariance or convert by such before potent; and thousand where the contracting for company, or produced, or, any right by one one yight to make, may now the other than the other potents of the contraction of the

Mintent. This continue, subject to the forms and conditions thereof, shall continue in fall force and effect during the life of any or all of the potents which the Illimating Company is Homesic to use under or pursuant to take interment, or which it may benefit be believed to use by the Lifet Company. Torentist. The agreement of the respective parties hereto and the according to Revent shall also had and insert to the burstlet of the accessors and the assigne of the Lifet Company and of the accessors.

of the Illuminating Company.

In witness whereof the said The Edison Electric Light Company, party of the first part, and the said The Edison Electric Huminating Company of Nor York, party of the second part, each has caused three jurestate to be said-reflect by The Pfeddorf and each his remarked its conjectual to be indeed.

70 S

who atthed and attended by the occretary, the size and your tool above written.

(Every and in Despationals) Vir. is of every Also bird of glich Coresponding of the Conference of the control of the con

The Them Electric Illuminature Company of the Just

allest O Source of by Mile

# 1881. Electric Light - Edison Electric Light Company (D-81-26) [PHOTOCOPY]

04-30	Saperant				
1881	Ec. U. 8	Agrees			
	3	\$ The Edison Light-bound and Chiller F.	Electric pany		
	हीं - <b>कि</b> ंग अंगी - किंग	culler 5.	ewone.		
Cat. # 945					
N.P.S.	Ē				
	<ul> <li>Alama Ali</li> <li>Alima Alima</li> <li>Alima</li> <li>Alima Alima</li> <li>Alima</li> <li>Alima<th>in in the second</th><th></th><th>at - cds : j</th><th>L (T) L (T)</th></li></ul>	in in the second		at - cds : j	L (T) L (T)

### [PHOTOCOPY]

Agreement made this thinke the day of April 1881, by and between The Edison Electric Light Company, of the city of New york, hereinafter called the bourpary, party of the first part, and Miller F. Moore of Roselle, Union bo., New Jusey, party of the Lecond po Whereas the boundary is the owner of certain patents for electric lighting, and proposes to establish a Bureau for the inho duction of its explem of electric lighting en isolated brildings and certain isolated localities levenin after described, which Bureau may possibly be beingster transferred to a separate and independent Conforation, under such terms as the bompany may bereinafter prescribe: And whereas the bompany having confidence in the said Moore win his ability, everyy and judgment, proposes to place him in charge of said Thereau: Now this Agreement Witnesseth, First: The said Moore shall be and hereby is appointed the head or chief of the Deweau of Isolated Lighting of this bompany within the United States, and has expecial change of the introduction and soliciting for the introduction of the Company's system of electric lighting into the Sociated Drildings and Localities estrated within the United States . becoud: It is agreed that what is meant by Isolated Micholings and Localities within the contemplation of this agreement is as follows, viz .: 1. Buildings outside of gos limits, that is to say :- beyond and outside of the area where gas pipes are now laid : -2. Ruch buildings within gas limits as may be, for expecial teasons, considered by the Company as isolated, or which may have been excepted from any-district. 3. Small bowns and Villages of not more than one thousand

### [PHOTOCOPY]

inhabitants, a where the inhabitants shall not exceed five hundred few square mile. Third: The said Moore on his part agrees to devote his certire him and attention to the business of the said Bureau, and to nee his best efforts in effecting theintroduction of the boundary's dysterm with rapidity and ironomy: also to design or cause to be designed under his superinsion, all necessary machinery: also to super intend by limself, or by others for whom he shall be preponably the installation of the bourpany's eyetem into the said destated Binding and Cocalities, and further to conduct the business to the best of his ability, so as to make the same successful mechanically and functially, it being further understood that all contracts under with consumers and otherwise, under this agreement shall be much in the name of the bompany, and only by express authority of the Company, and that the terms and conditions of the same shall be entirely determined by the bourpary, and that the financial details of all business connected with said Bureau shall be under the exclusive management of the bourfacy. Fourth: it expenses shall be incurred by More for office rent, assistants, employees, or other expenses, without the approval of the bankany. But it is understood that More shall himself have the selection and appointment of all assistants and employees in his Bureau, subject, however, to the approval of the bourfary. Fifth: whereas this duiness of devoluted lighting which the bampuny now proposes to establish is new and until so that the Company sameof for tell whether it may be for its interest to continue to conduct the said buriness as a Reman of this Company, or to hours for the some in whole or in part to an independent boundary or lorporation to conduct the same inde-

Ċ

pendently of and aport from the bourpony; and whereas the language may hereafter desire in some instances to term over to loval bourponie, (which may be beneath established), exten plants or installations

actually completed by the said Moore, and whereas it is important that the bourpary should not be restricted or embarrassed in wating said housfers, but should have the right to do so without being obliged to obtain the consent of soud Moore: it is hereby agreed that the Company may here after make such transfers or changes tegarding the ownership and management of the said Bureau and of the business therewith connected, including all plants that may be installed pursuant to this contract, as to the bourpary may seen best and proper: provided that in the case of any such hunsfer a said Change, the said Moore shall be entitled to a doutine ance of his compusation regarding the plants or localities so hunsfured, in the same manner as in case of a burnination of this contact by the cit months notice herein provided for : but it shall be optional with the Company, in such sace or cases, either to sortime to the said Moore the said compensation or to pay him a round sum in liew thereof. luch sum to be fixed by Moore and the Company, or if they cannot agree, by an arbite to be mutually agreed upon.

Sixth: The compensation to be paid by the bampany to the said Moore under this Contract shall be as follows : vig : a salary of \$ 6.000 per aunum payable in monthly sums of \$ 600 and at the end of each worth : and, in addition there to, a commission of 5 per sentime on the net-profits of the business of said Dureau while under the management of Moore as aforesaid, after deducting from the gross receipts of the Beveau, all rent, balances finalisting Monis daluy), wages, conto and expenses connected with carrying it on. The accounts between the bampany and Moore shall be made up one in every three months , viz. : - On the first days of Jamany , April, July and October of each year. Should this contact he termiwated by the death, unsconduct or disability of said ellow, be shall not be entitled to the said talony, after the date of said bernination. Should it be birminated by the six months notice as provided for in the minth lection of this agreement, Moore's walnut shall berminate with said dix months: but, in any event, be

### [PHOTOCOPY]

whall be entitled to the said pournicion for our year from the date of the said humination, and no tryper it being become understood that the basis of all formissions for the said one year shall not include the new or invessed business and plants of the said year, but shall include and bedinited to such brings and plants as shall have been actually instated and highest up made this to touched at the date of the humination of the contract or apprecial.

Acourth: It is agreed that if More himself walks any inventions or abtains any patents relating to the business or enlipset matter of the - Sureau, he shall either sell the same to This Company, or shall being this longary to use the same for such fince as the bampany and he may agree upon. More himself make any inventions, as aforeard, du allowans shall be given by him in adjecting or determining the said -price for any assistance, suggestions, a advice that he may have had in making his inventions, from the bourpany, or any of it officer or employees. And if the boundary and More are mable to agree, the fire shall be fixed by an arbitunto be selected by mutual consent. It is further agreed that illowe shall not have any interest in any invention not belonging to himself, in anywise relating to the business of the said Bureau, or to the system of electric lighting of this boundary. and Moore hereby agrees that he will in good faith act as the agent of this boundary without further compensation, to procure for the bourpary so far as he can on the hest possible home, my and all insentions and patents which may be made or owned by ather persons in any wire relating to his Rureau or my part of the system of Electric Lighting of this boundary, provided the Company shall desire to be come possessed of the summe tighth: - More shall not while in the employ of this bourpany or while drawing any compensation of my kind

from it, render any services whatever to any other party

### [PHOTOCOPY]

sugaged in the same business as the Echson Cleckie Light formy willow shall be with the service of any party, carrying on the same or semileur business, or runder my service whatever to excle party within a period of at least one year form the date of the termination of this contract, provided the bourings is willing to pay to Moore the bourings as provided for in the digital section of this contract.

Muth: Either the bourpany or the said Moore may beruinake this Contrast upon giving six months widthen write, but otherwise it shall not be bernin ated except by the death, unecondered or permanent disability of the said Moore.

Senth: Inacurach as it is impossible for the hartes of this louchast to forese the best deadlyment of the hursens, and as it is the deadlyment of the hursens for adjust may new or disputed points that may have a may be mustacly just and frequent: at is agreed that any and all questions that my frequent fragter: at is agreed that any and all questions that my fund frequent of this forthand, or affecting the just and several right and interest of the forthand, or affecting the just and several right and interest of the facts thank, that, in the ment of the bourfary and those not him able to agree about the source, the represent to am arbite to be agreed upon between them.

Eleverth: Obberner artiles shall be dimended by sither the bounty my on More, both parkies shall in good faith join in the selection of the varie, and it is further agreed that the question to be submitted to the said and its further or artites shall be stated in wining, by the parme dominating the artitles shall be stated in wining, by the parme demanding the artitles are affected to be other party. Thereto the parties dealth to agree upon an architer, ouried question or questions shall be entirelied to three artitles included four, and said these shall be entirelied to three artitles included four, and said there shall be appointed as follows: lack purp shall name one, and the how there selected shall appoint a third; that it is

## 1881. Electric Light - Edison Electric Light Company (D-81-26)

## [PHOTOCOPY]

agreed, that any	and all dec	uions made.	by our as hit	
for in this inster	ment, shal	be final an	ol considerania	and the
the parties hereto	, and be bin	olina utan H	i ann	es-act
The a	greement ul	the restort		
the conditions h	greement of	· wood of the	a parres a	nero au
the conditions he bind and inwe	to the hours	then of them	v shall also,	recipios
bind and inure	Wihana	r g ruen	respective su	cceaeor
Licht Court	l delles we	neof the so	ud Edison	Electu
light Company.	Mar course /	un presents.	to be subse	iled A
its Resident, and	d se corpora	he real to b	e here to aff	ixed au
attended by its	ecretary, and	the soud	Moore bas-li	eren 1
mer Mis Mound and	Lead the do	, and year fe	ist above w	ritten.
(115-1	11 5	· 6	11/1	,
after Condaid	IN the	in thetie	hy H tung	Lay
gooddard	tecy by	Matin	hã Mi	Land.
	/ /			
1. A. Moone	12	112		3
A.L. Jmul	110,	John	m :	Ž.
A.L. Inney	——————————————————————————————————————	F.Mi	3	Z
A.L. Truey		T, M	3	3 3
A.L. Imuj		J.M.	3	3 V
A.L. Imuj		9,Mi	3	2 hours
				2 m
(Al. )	will to			<b>3</b>
Cipy of The	Willer F. W.	nore's f	ontract	
Cipy of The	Willer F. W.	nore's f	ontract	iy-
Cipy of The	Willer F. W.	nore's f	ontract	in the second se
Copy of The	Willer F. W.	nore's f	ontract	in in the second
Copy of The	Willer F. W.	nore's f	ontract	in in the second
Copy of The state	Miller F. W.	loore's f tic Tight ldays!	ontract Companies of 11, 1965 Could, Year of	rwey
Copy of The	Miller F. W.	loore's f tic Tight ldays!	ontract Companies of 11, 1965 Could, Year of	rwey
Copy of The	Miller F. W.	nore's f	ontract Companies of 11, 1965 Could, Year of	rwey
Copy of The	Miller F. W.	loore's f tic Tight ldays!	ontract Companies of 11, 1965 Could, Year of	rwey
Copy of The	Miller F. W.	loore's f tic Tight ldays!	ontract Companies of 11, 1965 Could, Year of	servery

# 1881. Electric Light - Foreign - United Kingdom (D-81-33) [PHOTOCOPY]

	It lighand .  Thomas of Colesin  - 6-  Drewel, chergany lompany		
	Paves of astorney  Daka March 1 1881	- 1	
	· · · · · · · · · · · · · · · · · · ·		
· (4021)			
			•

Mhoreas by an instrument dated December 31" 1878, made by and between Thomas A. Edison, of the first part, Drivet, Morgan & Company of the second part, and Egist. P. Faltri and Grovenor P. Lourey, as Thustees, of the third part, the raid Edison did consent and agree to give to Drepel, Morgan , Company control and power to sell or otherwise dispose of certain inventions made or to be made and letters patent there fr, granted or to be granted, in and for Great Britain and Ireland, and other places, all as is more particular -by set forth in said agreement of December 31 " 1878, to which, for greater cutainty, reference is hereby made Now, in execution of curtain provisions of, and subject in all things to the terms of said agreement, and particularly to such terms thereof as relate to the extent and limitation in respect of time of the interest in such inventions and patents which may be ocquired by Drupel, Morgan y Company thurinder, I Thomas of Edison have made, constituted and appointed, and do heuty make, constitute and appoint raid Drepel Morgan & Company, and the said firm as it may to hwaffer constituted and the legal enviring partners thereof at any time during the operation hereof, my true and lawful attorneys priesocable for me and in my name to take all proceedings and to make and sufficivily execute and deliver all unitings necessary t secure in my name, or in the name of my assignes, as they may be compelled by low or may be able in their discretion and determine to do, letters papert in and for Great Britain and Ireland, the Channel Alands, the

ble of man and such other portions of the British Dominion as may be included in any such letter pat--ent for all my inventions, discoveries, improvements or duries of or relating to means for developing of elec--tric currents and the application of the same to wee of elemenation or power or heating, being such in--ventions as are more particularly described in said agreement of December 31 th 1848 which I have made a may make befor January 1=1884) Subject however to such limitation and determination of the interest of said Iropel Morgans Company in such sivention and patents as are provided in raid agreement of December 31 " 1848, and to sele all the right, little and interest, which I may at any time herrafter have in all or any of such muentions or letters patent aforesaid, or undivided or other interests therein or rights of any character thereunder; or to grant liceuse a other rights to use or enjoy all or any there of either in the whole or in any part of the territory aforesaid; and for these purposes for me and in my name, if-necessary, to make eign real, stamp, acknowledge, verify, execute and deliver all deeds, contract, covenants, in priments of sale, assignments or liceuses, or other uniting of any character which may be necessary or proper in the judg ment of my paid attrucy to accomplish any of the penform of my agreement with Drepel, Morgan & Company as set forth in said instrument of December 31: 1878, or any of the foregoing provisions of this power \_ And I also empower my said attorney, if it shall he necessary or desirable for them so to do, in my name to agree with the purchasers of any of my inventions, discon eries, devices or letters patent therefor of the character

[PHOTOCOPY]

aforesaid, which shall be made by, or granted to me before January 1" 1884, or the granters of any undivided or other interest therein, or of other licenses or other nights to use or enjoy any of the some that such purchasers or grantees chale respectively have like little or interests or rights to those so acquired by them respectively in the inventions or patents of a date prior to January 1: 1884, in and to all futher inventions which I may make and in and to all further patents which may be granted to me of the like character and for the countries appropriate at any time between January 15 1884, and the end of seventeen years from the 31" day of December, 1878, with power to my said attorney, the raid Bropel Morgan and Company, and the said form as it may be hereafter constituted, and the legal sariving partners thereof, at any time during the operation of this instrument, to appoint other attency. or attorney in their place and stead, with the same powers and under the same conditions and restrictions herein prorided, and to make the powers of such substituted attorney or attorney at their pleasure -Movided however that the price for such further such tions a patents made a granted after January 1" 1844 and before the end of execution years from December 31" 1878 share be approved by me, or, if not approved by me, shall be fixed by the decision of two of three arbitrators, one to be appointed by me, one by the penchasor or licenses and the third by theretwo, and upon such approval a figure of a force there for and upon such payment or recurring thereof as my said altorneys may determine on, I authorize and empower them to grants and secure to such purchasers or grantee a africand such futher right little and interest as aforesaid, and for

1881. Electric Light - Foreign - United Kingdom (D-81-33)

### [PHOTOCOPY]

that purpose to do all such thing as are above enumerated and all such other acts or things as may be necessary to be done in the premises In Witness Whereof I have hereunt set my hand and

real this fait day of March on thoward eight hundred and eighty on

Scaled and delivered

Thomas alva Quien

Richard & O'Brus

State of New York

City and County of New York ) for On this sweath day of March A. J. 1881, before me personally came Thomas Alva

Edison, to me known and known to me to be the undividual described in and who executed the foregoing instrument, and he then acknowledged to me that he executed the same and

for the uses and perposes therein meutined.

Interkmony whereof I have hereunt, set my hand and affired my notarial real this reventh day of March A.D. 1881

Richard & OBni.

Notary Public King C. (a. 1 files w. 4.4.6.)

State of New York, City and County of New York.

I, WILLIAM A. BUTLER, Clerk of the City and County of New York, and also Clerk of the

LillAM A. SUTLES, Clerk of the Gity and County of New York, and shee Circk of the officer of Lorentz (Lorentz Clerk) of the County of New York, and shee Circk of Lorentz (Lorentz Clerk) of the County of the Count

## Her Britannic Majesty's Consulate-General, New York.



I, EDWARD MORTIMER ARCHIBALD, Esq., Companion of the MOST HONORABLE ORDER OF THE BATH, HER BRITANNIC MAJESTY'S CONSUL-GENERAL, FOR THE STATES OF NEW YORK, NEW JERSEY, CONNECTICUT, RHODE ISLAND, AND DELAWARE.

To hereby Certify, That I have reason to believe that the Signature subscribed and Seal affixed to the Certificate hereunto annexed, are the true Signature and Seal of Richard & O'Brille who was, on the day of the date of said Certificate, a Notary Public, in and for the State of NEW YORK, duly commissioned and sworn, to whose Official acts faith and credit are due,

> In Witness Whereof, 1 do hereunto set my hand and seal of Office at the CITY OF NEW YORK, this 21/21/1

thay of March - in the year of our Lord, one

thousand eight hundred and segons elighty one.

for the Controly onural, Flings on the Controls Courses.

1881. Electric Light - Foreign - United Kingdom (D-81-33)
[PHOTOCOPY]

ď	
И	Sy. 2. 10.2.
1	English.
31	English.
H	
Ì	
ŝ.	Cover ants by Fathi and Lowrey, Tustees.
Š	Lauren To
	zera coy, suiscees.
ř.	
i.	Dated charch 1' 1881
5	
3	(6)
ŝ	
3	\
i	
200	7.
C.	
200	
7	•
1	- 75
ł	. LYTH & Co. Engrossers, 120 Broadway, Dustable Building, N. Y

Mercas in execution of terms of an instrument; dated December 31th 1878 made by and between Thomas a Edison of the first part, Dracel Morgan bompany of the second partand Egisto P. Fabbre and Grownor P. Lowrey as Trustees, if the third part, Edison has by an instrument of even date herewith, transformed to said Trusties all his right, litte and interest in certain inventions in said instrument described which interest the said Trustees hold. I upon the hiest, and conditions in said instrument and particularly in the second artists thereof set, forth.

Now for the purpose of executing the proviseons of said agreement in respect to the inventions so held by them in trust, said Fathri
and Lowrey, as Trusties as aforesaid do herely
agree with Drexel Morgan and Company that
they the said Trusties, and the survivor of them,
will from time to time, as the right little, and
interest of Edwon in and to any of the inventions
and patents which are the subject of Edwon's
agreement with them, as contained in said
agreement with them, as contained in said
agreement of December 31th 1878, shall become
vested in them by assignment or other transfer from Edwon, assign, transfer or grant to

1881. Electric Light - Foreign - United Kingdom (D-81-33)
[PHOTOCOPY]

such persons as may be appointed by Dread. Morgan + Company either the whole right title and interest in and to all or any of the circultions and patents assigned by Edison to their or undivided or other interests in all or any of them or licenses or other rights to use or enjoy any or all of them in and for the countries named in said agreement of December 31th 1848 as they may be requested to do by Dread, Morgan Hompany. and said Falbre + Lowrey agree further with Dread Morgan & bounfairy, upon their request, to execute the powers given to them by Eduson by his power of even date herewith, in respect to Luch inventions covered by the agreement of December 31st 1878 as at any time may not have been specifically assigned to the said Trustees by making such grants, assignments, licenses or other rights to use or enjoy any of such inventions to such persons as may be appointed by Drexel Morgan Hompany as they may from time to time request in virtue of and in conformity with provisions of the agreement of December 31th 1878 in that behalf provided.

And the said Father and Lowey Tuester, here by authorize and empower Drevel Mogan Hourfrang to cell and assign either the whole or undivided interests in the inventions and pitents which may from time to time to acquired by said Trustees from Edison in pursuance of the provisions of the agreement of December 31 878, or to grant licenses or other rights to use and enjoy all or any of such right, little and interest therein as anay at any time be rested in said Trustees invarious said agreement of December 5 1878.

[1878]

In Mitness Mercof the have hereunts act our hand and seals this First — day of march \_ one thousand eight hundred and

Sealed and delivered

w the presence of Richard & O'Brew Egisto I. Math

State of New York

Eity and County of New York ) for On this seventh day of "March A.D. 1899. Effor me presentle, ceem. Egist of tables and Greeceur Porter Larrey, to me know and know to me to be the individual described in and who executed the forgoing instrument and they their severally acknowledged to me

1881. Electric Light - Foreign - United Kingdom (D-81-33) [PHOTOCOPY]

that they executed the same and for the uses and purposes there-

In testimony where of I have hereunts set my hand and affered my notarial real this seventh day of March A. D. 1881

Richard & OBrien

Actory Public King Co

(at fled w N. 7. 6.)

Ought Cloudy of New York.

WILLIAM AN BUTLER, Clork of the City and Chanty of New York, and also Clork of the City and Chanty to the name long a Copy of Remove. Do Blattler Clork of the City Control of the

The reason was not considered the first three horsests my land and affired the feel of the said to feel and County, the

## Her Britannic Majesty's Consulate General, New York.



I, EDWARD MORTIMER ARCHIBALD, Esq., Companion of the Most Honorable Order of the Bath, Her Britannic Majesty's Consulgeneital, for the States of New York, New Jersey, Connecticut, Rhode Island, and Delaware.

Bo hereby Gertifig, That I have reason to believe that the Signature subscribed and Seal affixed to the Certificate hereunto annexed, are the true Signature and Seal of Richard E. O'Brill.

Who was, on the day of the date of said Certificate, a Notary Public, in and for the State of NEW YORK, duly commissioned and sworm, to whose Official nets faith and credit are due.

In Witness Whereof, I do berouse set my band and seal of Office at the CITY OF NEW YORK, this CLGPUM

day of MOUSEM — in the year of our Lord, one thousand eight hendred and grown CLGPUY OND

For the Consonly brunner,

Fluings with Claverule,

Command.



South	210.3.
	English.
Trust to &	gioto P. Fabbi
and Giosvini	r I Lowicy
Daled ollar	ch 1= 1881.
of the	
n yê	
	•
	Decadway, Doublable Building, N. Y.

[PHOTOCOPY]

MMMAS by an instrument dated December 31° 1878 made by and between Thomas A. Ectison of the first part, Dread Morgan Hornpany of the second part and Egisto I Fabbri and Grovener I Lowey as Tructus of the third part, the said Edison agreed to assign all his right; litte and interest in certain inventions to said parties of the third part upon the brusts in said agreement declared.

Now in cocccution of the provisions of said agreement and particularly of the owner clause thereof, and for the consideration therein recited and in further consideration, of one Dollar paid to me by the said Egisto I Tabbri and Grovens I Lowry be for the scaling and delivery hereof, and the receipt of which is hereby acknowledged, I, the said Thomas abdison do hereby sell and assign to said Egisto I. P. Tabbri and Grosvenor I Lowry all my right, title and interest in the following letters patent of the United Kingdom of but Britain

and Ireland namely: such letters patent issued to me dated October 23". 1848 and Numbered 4226 for an improvement in the method of and means for developing electric currents and lighting by electricity; also each letters

[PHOTOCOPY]

patent issued to Edward Griffith Brewer, as a communication from me, dated November 9th 1879 and numbered 4502 for improvement in lighting by electricity; also such letters patent issued to ine dated December 28th 1878, and numbered 5306 for an improvement in the means for developing magnetism by electric currents and in eller minating apparatus for illuminating by eletrocity; also such provisional letters patent issued to me dated June 17th 1879 nevembered 2402, for improvement in electric lights and in apparatus for developing electic currents and regulating the action of the sume; and I also sell and assign to said Egisto I Fabbri and Grosvenor P. Lowrey all my right, title and interest to make, use and vend in the United Kingdow of Great Britain and Ireland the Bland And Memore Member force the Sile of Main. All my inventions, improvements and devices betherto made in or relating to means for the development of electric currents and the application of the same to use of illumination, fower and heating, and all my right, tille and interest in, to and under letters patent of the United Hongdow of Great Britain and Ireland for said inventions, improvements or devices, or any of them, whom the bust, neverthe less, which are hereby assumed by said Egisto S. Fabbri and Grosvenor & Lowry and

### [PHOTOCOPY]

signified by their signature to this instrument, First, to hold said letter patent and inventions for the objects and purposes of the said agreement of December 31th 1878, as therein set forth, in this behalf, and from time to time by a suitable act and deed to assign the same or any part thereof. or privilege thereunder, to each person or persons and in such manner as may be directed or appointed by Drevel, Morgan & bompany; and in case Drexel Morgan & Company shall have failed to dispose of the principal or controlling invention referred to in the second clause of said agreement of December set 18/8 before the 1st day of January 1856 then on the further heist, upon demand in writing by me served on said Dresel, Moigan + bompany at any time within sise months after the confination of such period, to reconvey to me all said patents and inventions so assigned to them, Subject however to such rutstanding licenses or partial or absolute assignments as may in the meantime have been made in good faith under the direction appointment by Dread, Morgan + Company, but otherwise free and clear of all claims and demands on the part of said Trustees, or any persons claiming by through or under them.

In Witness Whereof I have hercunto set my hand find scal this Tuck \_ day of Mar Ch one thousand eight hundred and

Nete She words the Channel. Mande and the Sile of Man off-line of 2 page, be freier centin Thomas a Carser

Richard & OBrien

State of New York

City and County of New Inte & on this seventh day of March d. D. 1891, before me powerely came Thomas Alva Edison, to me known and known to me to be the individual

described in and who executed the fregoing instrument; and he then acknowledged to me that he executed the Dance and for the uses and purposes therein mentioned

In testimony whereof I have hereunt set my hand and affered my notaval seal this faculto day of march

Richard & O'Brien . Mary hubbie Kings le ( cut filed in N. Y. Cot)

State of New York, City and County of New York.

Compares graves for zero.

1. "Critical State St

IN TESTIMONY WHEREOF

this set my hand and afficient the Soul of the said, day of 15 08 millions

[PHOTOCOPY]

## Her Britannic Majesty's Consulate-General, New York.



I, EDWARD MORTIMER ARCHIBALD, Esq., Companion of the MOST HONORABLE ORDER OF THE BATH, HER BRITANNIC MAJESTY'S CONSUL-GENERAL, FOR THE STATES OF NEW YORK, NEW JERSEY, CONNECTICUT, RHODE ISLAND, AND DELAWARE.

Do hereby Certify, That I have reason to believe that the Signature subscribed and Seal affixed to the Certificate hereinto annexed, are the true Signature and Seal of Richard, E. O'Brille who was, on the day of

the data of said Certificate, a Notary Public, in and for the State of NEW YORK,

duly commissioned and sworn, to whose Official acts faith and credit are due.

In Witness Whereof, I do hereunto set my hand and seal of Office at

the CITY OF NEW YORK, this EIGHTH day of March in the year of our Lord, one

Jo M. Consulferment,

Flerry of Clevents,

Comme.

	Shomai A Edison 4.  legists P. Fabbri and  Grownor P. Loury	
	Power of Allowy  [England]  Jated March 14 1881.	
D. A. CESCALLY PROS.	Neg y	
To the state of th		

Mirror, invenicution of provisions of the third article of an agreement dated Ferenter 31 11/1 mode by and letwer Thomas A Edwar, of the first part, Iwall Morgan's Company, of the second part, and legulo P. Father and browner P. brong, Tweler, of the thord part, the said Calver has awigmed and has agreed to assign hereafter to said Father and browny a Juster, culain mountions and improvements of the character actions are described in raid agreement of Recomber 31-18/18.

Med whereas it is provided by said third actions.

that in respect to any invention; improvements and disciss of litter patent of the character aforecied which at any time shall not have been assigned by said betseen to said Institute the said betseen to said Institute the said betseen of the town of the tow

May in execution of soud provision, I the said Mornas A Edison, have made, conditited and appointed and deprint the said legists P Lathi, and leavener & Lavey and the search ver of them, my true and leaveful attennys and atterny very lim, my true and leaveful attennys and atterny very very said from and in my vame, place and stead, to sell, assign and transfer to such pursus as may be appointed by Suyel, Margan's Company, leving such pursus as may of any of any of such a shall thereby for how become purchasurs of any of

the invention improvement, devices and letter patent contimplated by said thent article of their agreement, all my right, lett, and interest in and to all inventions improvement, device and letter fatent of lacal lindium and statent there are said, agreement which at any time by the 31" day of James agreement which at any time by the 31" day of James

any, 1884, may have been made by me and which shall not than have been specifically assigned to said Father and boury; and also to grant, assign and transfer un - divided or other intrusts or rights of any description in or under such inventions, improvements, devices or letters patent aforesaid, and for me, and in my name, to grant to such person so appointed by Inevel, Morgan & Company liceness or other rights to use and enjoy all or any of the then unassigned invention, improvements, devices or letter patent, either in the whole territory carend by raid agrument of December 31 1878, or in any portions or places thursf, and upon any exclusate, grant, assignment or transfer as aforesaid to make, transfer, assign, sell, stamp, execute, verify, and deliver in my name, and as my act and deed, all agreements, covenants, instruments of sale, assignments, licenses or other agreements exindruments in unting of every nature which may be necessary or proper in the judgment of my said attorney or the securior of them to effectuate any such disposition as a foresaid of all n any of my said unassigned inventions, improvements, devices or letters patent according to the appointment and direction of said, Drepel, Morgany bompany, with power & my raid attorneys and the evourior of them to subtitute The atterney or attorney in their and his place hereunder and to revoke the powers of such substitutes in their dis--cretion. - <u>Provided only</u> that, a stipulated by raid third article of the agreement of December 312, 1878, any such sale, license or other grant of interest as aforesaid to be made by my said allowers or attorney, by inter here of to such appointers of Drevel, Morgan yles, shall be limited ti such and no greater estate, intrust oreight of use than

## 1881, Electric Light - Foreign - United Kingdom (D-81-33) [PHOTOCOPY]

that then amed by such appointed in the inventions, in--provements, devices or letter patent aforesaid originally puchased by them. In Witness whereof I have hereints eet my hand and real this first day of March one thousand eight hundred and eighty one Thomas alva Edwar Sealed and delivered in the presence of Richard & O'Brien State of New York bity and bounty of New York ) for On this fifth day of March A. D. 1881, before me personally came Thomas Alva Edison, to me known and known to me to be the individual described in and who executed the fore--going instrument, and he then acknowledged to me that he executed the same and for the uses and purposes therein mentioned In testimony whereof I have hereunt set my hand and affixed my notarial seal this fifth day of March A. & 188 Richard & OBrien Notary Vublic Kings l. (cert: filed in Ny. 6.

IN TEATIMENT WHEREOF, I have log souto set my hand and a sized the Soil of the said county, the day of AB nttte.

LHAM A BUTLER, Circle of the City and Counsy of New York, and also Circle of the Soutypes Oint for the saled Circle of City and County, the sense being a Congred Record, Do Hestelly 1887.

Last Bircle in the Clerk's Office of the Congred New York, a recition copy of the appointment and the Congred County of the County of the Congred County of the Con

## Her Britannic Majesty's Consulate-General, New York.



I, EDWARD MORTIMER ARCHIBALD, Esq., Companion of the MOST HONORABLE ORDER OF THE BATH, HER BRITANNIC MAJESTY'S CONSUL-GENERAL, FOR THE STATES OF NEW YORK, NEW JERSEY, CONNECTICUT, RHODE ISLAND, AND DELAWARE.

Do hereby Certify, That I have reason to believe that the Signature subscribed and Seal affixed to the Certificate hereunto annexed, are the true Signature and Seal of Flichard. E. O'Briell who was, on the day of the date of said Certificate, a Notary Public, in and for the State of NEW YORK, duly commissioned and sworn, to whose Official acts faith and credit are due.

> In Witness Whereof, I do hereunto set my hand and seal of Office at the CITY OF NEW YORK, this Cighth ——
> thay of March — in the year of our Lord, one thousand eight hundred and wrote Righty onle for the Como alf ormul, Flimpont Clavanda, Com al.



## 1882. Electric Light - Foreign - United Kingdom - General (D-82-39)

### [PHOTOCOPY]



. Hen by these Presents that whereas byon agreement made between a Vision of the list hart Dreft Storgan & Company of the sea amentus nun eatem of the past pear the pell. Maryon by berngany of the team of past lights facile to the and flower and the past be past to the theological made the past of the past of the team of the past of t ogsjit. Hog jel tta parjest of executing and agreement in the respect of execution the said Manga. Anti Gridery of proving authorize, enquere and direct the world. Het Charles are Charactel Griffith Berner & reseasy or sering and transfer to cold tangen all of the litters paken afrocain which shoud in their names respectively and on my behalf to make sign, seak stamp woknowledge, visify execute and eletiver to suit dompor all such instruments of sale conveyance assignment or otherwise as may be necessary to rist in said company all the right little and intrast which rither or the said fenser or Brucer have in any of said letters futent laken in the numer of either of them. In witness whereof I have become set ving hand and seal this seventatiday of February in the year for thousand infil hundred and mus afua Elisen

Charles Roth

United States of Shurring

on the 1 day of Sebraary in the year one thousand eight hundred and eights him before the piesonalize and similar secretary in the year on thermal eight hundred and eights the before the piesonalize and between the the individual describes in and who excepted the foregoing instimuent and acknowledged form that he executed the same. I than the foregoing instimuent and acknowledged for the than that he executed the same. I than the foregoing instimuent and acknowledged.

# 1882. Electric Light - Foreign - United Kingdom - General (D-82-39) IPHOTOCOPY]

[F	ILMED IN SECTIONS]		
	1	11	202.8
-			
ļ	.2	and the second	

This and enter water the wath day of April One Thousand wife hundred and explict and explict the letwer Thomas the Colorent Sank Have found the back of mures of the find from the colorest Explicit Concerns of the the Otto Transmission was annual of open over remained upon the manage and the second of the second part the second file former of the least forth the first through the second file former of the least to the second file for the second of the second file former of the least to the second file former of the least to the second of the second file former of the least to the second of the second file former of the least to the second of the second file former of the least to the second of the second file former of the least to the second of the second file former of the least to the second of the second file former of the least to the second of the second file former of the least to the second of the second file for the second file file for the second file for the Last rithe point land hand good bear leary techny congrag or tumor as house as house a low bear on freshed up note ling from and from and form and for the first forth forth forth forth of the soften description of the first forth of the soften description of the soften descriptio Age, the great process of the fifty and and the there were the state of the first and the state of the sta White to see common common to the property of the second o there was that the soil France the beam with the amoreover of the frantise there by the security and trust and soil parts would will and arrige to the been pany the said execut public legislar with the literia lamber and their flaw of and the leave of coloring to they pro more to see I made in the Company for the rock from the sea of seas in the contract of General from the seas of the season for the contract of the second from the season of the first hort with represe to the soid fatines from front heart on the work of the bine and forward fit he attended to the raid it most format for failing from the fit of the form for the format of the first front and for failing from the first front for the format of the first front of the format of the first front of the format of the first front and it was by the said agreement also agreed that the Company should fay to the parties there of the second part on the secondin and advisay to it of the neces at the test by the sand Agreement the surgest date to company principle or a section gives above an accusance on an accusance or an accusance or acc the latest growing the peak with squared the special side of the special side of the special s A Charles the was an being and of the said agreement the bringing bear for it the said beard dinger and beengang the sum of the said Beard thousand bear for the free from the said from then trade with subjected the said potents flant because out "saw of the last of the last of the last accument of which seeing fronts flowered pariet the said potents from thousand for humans for humans for more marginist in fall for the same of borners bornered as funded bounds in fair lamond of the case doe in restrict of the raid blank ofred referred as the date of the execution of their bounds the said Therman Agended no consideration and the second of t while heart of the fait fouth and fifth parts a bourfinal concer bearly origin and conform to the Company all their this second fragent is the thream from to the cour of the chare to be alletted to him as a freezad; And the said Thomas Alon believe deth hereby command with the to to any course of no conserve or accessor of the latest specified in the Schedule head membered superhaly 4250 and 394 and dished agight and his boomly fift day of behinder tru blumanic aight bourderd and righty and unit wind tuck production and delicing a afginal to seem of the confundation a now diversy of the raid without a cither of them, affect the said. Home often bettern delle hands faithe common all available for he limbany all extensive of the card patentriple, and communicate to the Company all emprocuments which every to a nindrin a first larmid witnesses and improvemed any sent 2 the opplins have of Antivilly or tragarism as a large house a may so modely the position and the opplins have of Antivilly or tragarism as a fighting having and models of the contraction of the contrac

# 1882. Electric Light - Foreign - United Kingdom - General (D-82-39) [PHOTOCOPY]

[FILM	ED IN SECTION	ONS]
	1	
	2	

	The dehedule above referred to	The second secon	
Part One	Cart de	Bat Three	3 V
With About 20th North Ball	or of later son wellish	di Sale et et laine Late.	i i
5 1536 October 23. 1971 4502 Arrendon 9, 1979	2992 June 7. 1881 3.000 2995 June 2	Leptoniko 25 . 3932 Leptoniko 1. 1981	1
176 Same 17 1179 139 Subscrip 1. 1181	3231 Paly 25 . 3449 3453 Arion-11 . 1391	Aptende 11 . 4034 Chimber 19 . Carter 17 . 4552 Carter 17 .	
15 Janey 1 111 120 March 31	474 Gilman . 512 4571 Ottober 10 . 792	February 2 181 4553 Catelor 18 .	
57 57 2 Sthong 1. 1 193 offer 25 .	8576. Ocholo 19 . 1812 2492	Alone 5	
has a second of the second of	the presence of B	ally 6 . 1	"
Munice From	<b>`</b>	Thomas alva Chison	7.U.E
Mailain Water of internation \ A Landon			65,8
their of their this to the state of the stat		회사에 가는 하겠다는 일본다.	<u> </u>
and fundament therein investibilities which we the live of which they former against the state of the property of the state of the stat		14일 기사 등 기념을 보고하다고. 14일 기사 등 기념을 보고하는 12일 기사	, B.T.
William to make the way that they operated the some forthereses		anny Japo Real	47.6
The state of the s		Some authory Durch	TAO
Take with spec to me that he had been the own to my how one office the or he had been a second of the had the ment of the the second of the had the second of the had the second of the had the second of the th	회사들이 이 가나를 깨끗했다.		J.em
Chas Aoth 68)		gut Parts Pattil	8.H.F.
MotaryPublic		James How Warght	).n.n,
in the second		Chan themy Confry.	6.Hq
		Egiet Parts Table	E EHT
		Grown Pole Josep	2 9.81
- <b>&gt;</b> 기타기 되는 그 그래, 그리다.		The state of the s	10
		10 % (10 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m	

1884. Edison, T. A. - Employment (D-84-13)

1884. Edison, T. A. - Employment (D-84-13)

celum o hope you mil onthe dum vay action aumanoutable in from it an inconveneur to you day acqueet pully flaght damethan flaght damethan 142 Neist What Short york is hope 1854

1884. Edison, T. A. - Employment (D-84-13)

### 1885. Edison, T. A. - Book and Journal Orders (D-85-10)

## [1885]

Doll Mead Co gorther matter Miebuhr Greek Haros 1 mutte wered 150 200 Literay Slight, 300 of mental Physology 175 1,25 Morris - Brilis & Thoughts. 19 P Cooke Scientific Cutture. 1,00 Robertson, diving that's Victor Hypo by Buton Vicking Tales Gy Anderson. 1.00 Fencion by Arthankund

## 1885. Edison, T. A. - Book and Journal Orders (D-85-10)

## [1885]

Figurers Burder Robber 4600 Ocean world 150 Vegetalle covered 150 World before Thelings - 150 Gattons Robberson 1,00 Garner - Brilliand 3,50 Garner - Brilliand 1,50 Garbeeld Life Clivente. 1,50 Glzeikie - Jec 690	Wister Unobrogad Wis Jevons Many 176- Lubbook - Swyola ( 300 Paece ant the Villain cooks Hillorally - Swinds Lasteur - Life 150 Thanks I Marin Simila 150
Gosse's Meanscripe  Jo Wortamillow Pholonys  Jeo Hornis Ceoling almanscripe  Ser of Ju Herschel astrony  John S Hittell Culture  Jiro Wearling Peculiar  Jose Howe Company  Jose How Company  Jo	Life Charle for hook y 50 Yosephers boths 3.75 Yosephers boths 1.00 Hybridge Widtholl 1.20 Hybridge Windle 1.20 Sydny Smith by Stadland - 1.75

# 1886. Telegraph (D-86-39) IFROM ALFRED O. TATE (INCOMPLETE)]



New Hotel Lafavette

Paul Bassert Eg.

Denrsin:

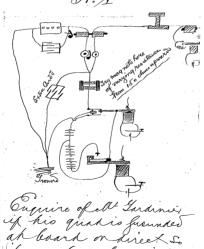
Jues yeartelegram answer of for in response to see M Maner at 63 Brandway whomeyon earled assist.

I tested grad wire with phone Connections to New York tongth and I think are can work it.

I want to test again tomorrow and to try Connections as per diagrams fellowing. Please go to

1886. Telegraph (D-86-39)
[FROM ALFRED O. TATE (INCOMPLETE)]

Main office and connect like this: -



ve try shore with



Essen,6th April 1891.

ans 30th June 189

will bill but there are W

My dear Mr.Edison,

Ever since J have received your grand present, J have turned about in my mind, how J could embody the mark of attention which J was longing to put before you so as connect it in some way or other with the line of business which J pursue. J could not send you a gum for your own private use. At last J have conceived the idea to put together an arrangement of writing table implements out of models of guns and projectiles.

Although the work has finally not turned out as tasteful as J wished it to be J may say that it was conceived with the best intention and in handing it to you J beg to assure you that its accomplishment has been followed by me with a most keen and hearty interest.

You may like to know that J have presented a duplicate to His majesty the German Emperor and that said duplicate is the only specimen in existence besides yours.

J sincerely beg to request you to kindly receive the small gift as a mark of my great esteem; should you ever make

### 1891. Edison, T. A. - General (D-91-02)

Drif ilmat dru, messe



use of it J would be very pleased indeed.

Believe me.my Dear Sir.

Yours most faithfully

. doath and hach v

Ever maned have releated work near

Ever eined i name referred your maint prose to the order of the control of the co

nome way or chiffer with the lifes of business which it purers.

Could not see a year a gum for your own private use. It was
these sometimes in idea to put towards as excurred the

is the tone the termine our visual's and who the terminal and the terminal of the terminal of

fol on J wished it to be, J may say that it was enceded on the best intension and in handing it to you J bee so ensure or that its accomplishment in when followed by no with a nect block mad heavey interest.

You may like to know that J have presented a daultears to His majesty the German Depends and that said doulieuts to the only specimen in existence besides yours.

J sincerejy bon to request you to kindly receive the small sift as a mark of my read assemptions should you start some

## PROGRAMME

## MATINÉE MUSICALE,

AT THE RESIDENCE OF

# Mrs. Thomas A. Edison

"GLENMONT," LLEWELLYN PARK, ORANGE, N. J.

Saturday, May 16, 1891, at four o'clock,

(Through the courtesy of Mr. Franklin Sonnekalb.)

. UNDER THE AUSPICES OF

Hakuai Circle of The King's Daughters of Calvary Methodist Episcopal Church.

BENEFIT FRESH AIR FUND AND FLOWER MISSION

The following Artists will assist:

MISS LILLIE P. BERG, SOPRANO,

MISS FLORENCE MEIGS. CONTRALTO.

MISS AGNES STEWART, CONTRACTO.

Mr. FRANKLIN-SONNEKALB, PIANIST

And also the following Singers, (Professional and Amateur).

SELECTED FROM MISS BERG'S VOCAL CLASS.

Miss MINNIE AITKEN. Miss FLORENCE MEIGS Miss BIRDIE O'NEILL. Miss MARY ANGELL. Miss ALICE DYCKMAN Miss MINNIE O'NEILL. Miss MINNIE C. OUIN. MISS LILLIE E. FENN. Miss HARRIET C. PALMER, MISS MINNIE FRIEDMAN. Miss SELMA ROTHSTEIN. Miss CARRIE FOX Mrs. ROBERT S. SIMMONS. Miss LILLIES W. GRACK MISS KITTLE STEBBINS. MISS EDITH LAUTERBACH MISS AGNES STEWART. Mrs. EDWARD LAUTERBACH. Miss MARY VAN BEUREN. Miss CLARICE LUDLAM. Miss ALICE E. WRIL. MISS ANNIE MEYER.

Miss LEONORE WOODWARD.

Miss ALICE BLAKE, Accompanist.

## Programme.

1.	a. ETUDE	No. 1. 0	op. 25. (	(Acolian Harp)		Chopin
	b. ANACI	EON.	-	"To his Lyre"		. Saniekalli
			Min. F	RANKLIN SONNEKAL	.15.	
*	DUET.			"Noeturne"		Denza
			New ()	Dedicated to Miss Be	rg.)	
		Miss I	ашак Р.	Beeg, Miss Flore	NCE MEIGS.	
3.	a "Comm	ent disaic	nt-ils ?"			Lina

Comment, definient, by collection persons are not suggested. Comment, dissiont-like obligation questions and account of the comment, dissiont-like, enchanter les belles sans philtres aubtile. Almez, almez, dissiont-elles, Ramez, dormez, almez, dissiont-elles, dissiont-elles, dissiont-elles.

"Twiss April. 1 Twis April; 1 twas Suiday; the day was fair,
Yes 1 sunny and fair.

And how happy was I!

You were the white dress you lov'd to wear:
And two little flow're were hid in your hair,
Yes; in your hair,—
On that day, gone by!

We sat on the moss, it was shady and dry, Yes! shady and dry: We sat in the shadow. We booked at the laws.

We looked at the sky, We looked at the brook which bubbled near by. Yes? bubbled near by. Thro' the quiet mesdow.

A bird sang on the swinging vine.
Yes! on the vine,
And then sang not:
I took your little white hand in mine:

Twas April, 'twas Sunday: 'twas warm sunshit Yes warm sunshine: Have you forget?

MISS LILLIE P. BERG

4. FANTAISIE ESPAGNOLE, (first time)

Dedic à Madame de Barrios. Mr Franklin Sonnekaln.

PROGRAMME CONTINUED ON 4th PAGE

## Programme.

The Cantata.

KING RÉNÉ'S DAUGHTER.

Smart

Conducted by Miss Little Berg.

No. 1 Course

No. 7. Time and CHORUS. Missi Selha Robstein, Miss Allice Well, Miss Ackes Strwart.

No. 3. Degrand CHORUS. No. 4, ROTE and ARRESTA

Mischaules Grace, Miss Agres Svewart.

No. 5. QUARTETER.

Miss FRORENCE Meios. The Misses Data Made Charles Went STEWART

No. 4. Sciena and Cironers.

Miss Stema Roymstein, Miss Alice Well.

No. 5, River, and ARIA.

Miss LILLIUS M. GRACE,

No. '8. REST.

Miss Stress Roynstein, Miss Adves Stewart

'Mrs. Rodent Spring, Miss Clearer Lebeau, Miss Agnes Stewart

No. 10. Dust and CHORUS. Miss ARNIE MEYER. Miss Auxes STEWART

No. 11. Beer and Citopes

Miss ALICE DYCKNAS

Mrs. ROBERT SOURCE

## KING RENÉ'S DAUGHTER.

### ARGUMENT.

Iolanthe -- daughter of King Rene, Count of Provence -- has been betrothed in infancy to the son of the Count of Vandemont. Stricken with blindness when but a year old, she has been reared with all knowledge of the faculty of sight withhold from her. A leach or magician has promised to restore her sight, by means of an annulet be has given her, on condition that she is first informed of the missing sense; but the king has refused permission.

Iohinthe's betroibled, wandering as a troatasion; lights upon her abode in a valley of Vawelnes. With out knowing her—fora heritorial tood has kept their lives apart—the trooloobor knight is enthralled by her beauty. He does not know that he is blind, and his words overal to hel to faquity of which she has been kept in ignorence: he thus unwritingly able the nogician' ant, and lobarith is retorated to glind.

This story is freely adapted from Henrik Hertz' drama

No. 1.-OVERTURE.

No. 2.-CHORÚS.-Vintaures

Volley of summer flowers! Valley of golden grain! Valley of vinoyand bowers!— How sweet in such home to remain!

Here the first smile of spring is the sweetest. Here the rose-day of summer is long. Here the glad autumn rite is held meetest. With golden-len'd chapter and song.

Here the garlands of spring first are glowing. Here her brightest the summer-time weaves Here the year has of authors's bestowing A grape joweled crown of corn sheaves.

Antiev of summer flowers! Valley of golden gmin! Valley of vineyard borrers! How sweet in such home to remain!

No 3.-TRIO (Soprano, Messo-Soprano, and Controllor AND CHURUS .- Unitagers.

See how gay the valley shines in the early morning hours— With its belt of amber vines And the silver olive bowers!

And on siver bounds of pring— There—al. (Inter than the spring— Dwells the daughter of a king, Blind from infancy, she knows But by touch alone the rose; But by touch alone the rose; Sight to her is all unknown

Still they say th' one hanter's pow'r.
Bock will give the priveless dow'r.
If but first boal the "policy".
One her loss to her may tell;
Loss that heve has long conceal'd.
Now to her must be reveal'd?

Hearken up the olive way.
Where her hand-maids gaily sing,
Ever cesseless is their lay.
Of the daughter of the king.

#### No. 4,---DUETi Mega-Soprano and Controllo) AND CHORUS.

#### ....

There is a fair maid dwelling there-In pearless is anty chaste.

Life sunleam floats her golden hair
To the diamonds at ter waist:

Any our the grardest bloom sley goes As bright as spring's first rev. That wakes the blushing timid rose And green leaves on the spray.

To her how'r there comes a lute, And a soft voice sweetly singing, and the nightingale grew mute. While the voice and chord are ringing.

And the nightingale grew mute. While the voice and chord are ringing.

#### Marta

There is a fair maid dwelling there With simple, gentle taste; She wats not of her gol ion heir Nor the diamonds at her waist

But often at her easyment pane. She waits the night-bird's some And voice and late are heard agai . In the gloom her bow'rs among.

#### Dence.

To her how'r there comes a lute, And a soft roice sweetly singing.
And the righting do grows mate
While the voice and chord are ringing.

And the nightingale grows mute While the voice and chord are ringing.

#### No. 5. -RECIT. - Mezzu Soprano. Marta.

From her bow'r Hearkens my lidy fair, Wild funrain at the starry hour Filling the raptur'd air? The nightingales?

#### ABIETEL

List'ning to the nightingales. List bing to the nighting ales.
Comes my haly fair—
While the glowing twilight pales,
Come the star-beams there;
All the vales me sweetly ringing.
Is it joy or pain?—
Melody the winds are bringing
Oft—ngain again?

Come the star-beams there Comes my lady fair, List'ning to the nightingales, Comes my lady fair,

List ning to the nightingales Waits my holy fair. Till here ear a foot-fall hails, On the terraco stair? All the vales are sweetly ringing— Joy or plan the tone?— As her heart to her the singling: Joy to joy alone!

Come the star-beams there, Conses my lady fair, List ning to the nightingales, Comes my lady fair!

#### No. 6, -QUARTET, -Two Sopensi and Two Contralt?

### Solo Soprano.

Who hith seen the troubadour?— Who hath heard his song?—

Vintagers. We have seen the troubadour, The pleached walks among.

On a bough he bring his sword, While his lute he smote. We could hear the sound and word On the still night float.

#### Solo Sourann

"Take, oh! tike one rose"—he said—
"If it be but one."
Pearly white or ruby red."—

Answer made she none

Ere he smote his lute once more Took she roses twaln: Happy be that treatment, Singling not in vain.

### No. 7. - SCENA AND CHORUS.

#### Marta

The spell was wrought-for now she knows. What we have dayed not disclose

#### CHORUS.

She knows the gift of sight, she knows. What they have dared not to disclose. Martin Realrice and Charus.

Oh! happy chance, that minstrel's by Should nel th' enchanter's power to-di

### Bout rios

#### Mareta

Hark ! where she sings below-

A pussion through her singing steals.

### Marta, Beatrice, and Chorus,

Yes-th' enchanter's spell has wrought the mystic pow'r-She wakes to sight—to sight, that priceless dow'r

### No. 8.-RECIT.-Soprang.

Interestina

White or red?-

Here with its bloom
Each silken leaf bestows
The negter softness of a sweet perfume—
I only know it is a rose.

# Aug. Hove the rose pearl'd with the summer dew— Fresh with the dawn it siept upon the spray. And there each morn the gale on light wrings flew. A round the bower to steel some weret away. With all its wealth I call the blossom unine— Sweet flowr, what charms those silken leaves disclore.

I love the rose—because the gift is thine.

I'll love the rose when all its heanty's past.
And when the fresh folds with ring fall away,
for there enhand it in sweetness to the last.
For there enhand it in sweetness to the last.
Sleeps the full joy of many happy hears
'That still in dead leaves men ye and drine:
Throot in my heart—the queen of all the flow esI'll love, the rose because the gift was through

### No. 9.—RECVI.—Marta (Mezzo Soprano).

What magic in a minstrel's sone must dwell. That sight can thus restore. Say, of this minstrel knight, what do they tell, What form, what look he wore?

#### Beatries (Controllo).

A gentl- knight, they say, in form and face, As e'er set lance in rest for lady's word;

A jewel'd baldrie did his shoulder grace, Bearing both lute and sword. The kaldrie on his breat but half conceal'd A bright star shining in an azure field.

Star in an azure field!—then it were he,
The long hetroth'd one, 'tis pussing well:
The gift of sight by him made known should be,
His song should aid the spell;

#### No. 10.—TRIO.—Beatrice (Contralto).

Now amulet and spell

Have wrought the mystic pow'r,
All: me—what words can tell

The rapture of this hour:

#### Intauthe (Sairano).

See where she comes—her smile Seems as to light her way; See how the flow is beguile Her loit ring feet to stay.

#### Infanthe (Sonrana.)

With welcome glad and sweet.
The flow'rs ground me rise,
With joy my heart to greet.
My heart with joy replies;
Like these were wont to glow.
The dreams of happiers hours.
It seems to night as though
My thoughts were turned to flow'rs.

#### Iolanthe, Marta, and Beatries.

Before | my | gase what region beams She knew not even in any dreams, The flow'rs | I | lov'd how fair they ship What joy is | mine! |

Now unrulet and spell
Have wrought the mystic power.
All me what words can tell
The rapture of this biar!

Oh! spirit charms, still dwell In every song and flow'r.

### 1891. Glenmont (D-91-33)

To your I now life neakes—
I have I have be to bring—
A new Lound joy to bring—
Alt? fair us do wring breaks
To glad the world in spring;
When all the shades that fell
With rail that a bloom and low I;
Joene golden beams dispel,
With raille of magic power.

Air! the--what words can tell. The rapture of the heart!

No. 11.-DUET AND CHORUS.- Merco.

Sourano and Contrallo.

Marta and Beatries. Sweet the "Angelus" is ringing. O'er the river, up the dell': Prace and rest to labour bringing. Chimes the bell schimes the bell.

All the vineyard bow'rs are still, O'er the mountain side— Dreams the shadow on the hill, Dreams upon the tide,

Village lights with cherry beam Through the twilight come— Dropping down the fleeting stream Glides the fisher home.

Morta, Bentrice and Chorus,

Sweet the "Angelus" is ringing. O'er the river, up the dell: Peace and rost to labour bringing. Chimes the bell—chimes the bell.

Silent sleeps the barvest plain Where the respers' lay Rose and fell – again, again – Through the long, bright day.

In the cloud land over the shade

Nee the thin moon lies, Like a shining sickle blade Resting in the skies.

Marta, Beatrice, and Chorns, Sweet the "Angelus" is ringing. O'er the river, up the dell: Peace and rest to labour bringing. Chimes the bell—chimes the bell.

> 12.-RECIT,-Mexta-Sopeano, Marta.

Oh what a dawn to-morow's dawn will be! Haste, the glad news unto the king to tell. Joy to his daughter—also joy to thee, The keight belroth'd, whose voice awoke the spall.

Fair fall the day, oh! speedy come the day, For bridal garland and for bridal lay.

IS.--FINALE. Marta, Beatrice and Chorus,

Rene, the king, will ride forth from the gate With his horsemen and banners in state, And the trumpets shall fanfaron ring To Rene, to Rene, the king?

Infauthe (Soprano).

Then cull for my chaplet one flow'r,
The fairest the bloom-valley knows,
For love that of song is the dow'r
May emblem its joy in a rose,

Rone, the king, will ride forth from the gate With his bersemen and banners in state, And the trumpets shall fanfaron ring To Rene, to Rene, the king! Then with rebee, and into, and with drum The bride in her leanty will comes— And the light of her eyes, they will say, bus sur-

pased
The diamonds that shine at her waist—
The diamonds that shine in her long golden hair—

Internthe

Then call for my chaptet one flow'r.

The fairest the bloom-valley knows for love, that of song is the dow'r

May emblem its joy in a rose.

CHORUS

Lond shall the trumpets their fanfaron ring To the preriess fair daughter of Rene the king!

# 1892. Electric Light - Foreign (D-92-26) [PHOTOCOPY]

Law Offices

EATON & LEWIS S.B. EATON EUGENE H. LEWIS 14 Broad Street (EDISON BUILDING)

New York July 12, 189

Thomas A. Edison Esq., 2 F

Orange, N. J. JUL 18 1892

Dear Sir:

Ansid July 15 18 12

was considerable correspondence and work done in connection with some assignments by you to the Brush Electrical Engineering Co. as to your patents in Australia, New Zealand, India, Ceylon and South Africa. Your original agreement with the Edison's Indian and Colonial Company provided that you should be entitled to a free and exclusive license under all the patents for purposes of locomotion on railways, tramways and common roads, such license to be at your own cost.

You will remember also that in 1889 the Indian and Colonial Co. was succeeded by the Australasian Electric Light, Power & Storage Co. and later by the Brush Electrical Engineering Co. The assignments of your patents to the Brush Co. were sent to you for execution and you submitted them to me to investigate the matter. After thorough investigation, I advised you that you could execute the assignments, and that you were entitled to the free and exclusive licenses in the various countries for locomotion purposes

as provided for in your agreement with the Colonial Co. I prepared a form of such license, which was approved by you and afterwards executed by the Brush Co. All this, however, had to be done
through Mesers. Waterhouse, Winterbotham & Herrison, of London, and
they now send their bill to me for their services and disbursomenta
as well as for an amount paid by them to the Solicitors of the
Brush Co., Mesers. Renshaw, Kekewich & Co., for their services in
regard to the completion of the license from the Brush Co. These
two bills amount altogether to £47. 18. 6, for which I desire to
send a Bill of Exchange to Mesers. Waterhouse, Winterbotham & Harrison.

Will you please therefore send me a draft or Bill of Exchange for this amount, to the order of that firm, payable in London, and I will write to them therewith, if agreeable.

Very truly yours,

1892. Electric Light - Foreign (D-92-26)
[ENCLOSURE (PHOTOCOPY)]

Brush bachicus Trymering Cot. No Brein

Leaw of of mers? Warahome Windaborkam

I Harrison the cum of Everly awar homos three

Sullings and six hence cosh of Secret to M.

Everin

L27. 3. 6

Plent of thewished

2/27/2.

1892. Electric Light - Foreign (D-92-26)
[ENCLOSURE (PHOTOCOPY)]

8

Dr<sub>sõ</sub> Naterhouse Winterbetham 8, Harrison

Professional charges in relation

## [ENCLOSURE (PHOTOCOPY)]

and the second second					este u
	New Cou		- L		
7.0	v (ew Wori Li	ncolnš	Inn:		
O. A. Edwar E.g.			don, s		~~
		Tefru	ary	10	192
Dr. io Vlaterhouse, Winterboo	tham &c	Harri	son!		r A
To Professional charges in relation to the					T
preparasion and completion of a yre excernice beine in respect of the &	ee amai				
and letters of regulation in refere whereto you redently expected segre	mee)				1
ristoria, Western Australia, South	emanua),			20	1
Sweemstand ever Dough Nales of ever	. Zenem. 1.			20	
and the Cope of Good Hope India of Althodones Corespondence of May be Jamuary 1892	1891				
	1				
To costs out of pocket, viz					
Stamps		10			
Gravelling Expenses, Cabo Sc Gostages & Telegrams		<b>వ</b> -	-		
Registration & other fees					1
Other expenses, wizt					
	1	.			
				78	)
	Ĺ				
	Ä.		10 -	20 16	5
Particulars if desired		, 1	- L		

Law Ollices

ATON & LEWIS 12

ECEIVÉ:

\_\_\_\_\_18

Thomas A. Edison, Esq.,

Dear Sir:

Re Bill of the Waterhouse Law Firm of Lordon, including amount paid by them to the Renshaw Law Firm. Rotal £47.12.6; I beg to submit the following:

suggested that you send me a Bill of Exchange for the above amount drawn to the order of Mesers. Waterhouse, Winterbothgan & Harrison. You may remember that this bill was for work done by said law firm in connection with assignments of patents by you under your original agreement of March I, 1883, with the Marquis of Tweeddale, at a (Rdison Indian & Colonial Company). Which date of the 15th ult, Private Secretary Pate wrote in reply to my suggestion as bowe, and said that you were under the impression that D.M.& Co. and G.P.L. had a contract with you relative to Australia, and that if this were so, they should pay this bill After thinking the matter over carefully, I have decided not to broach the matter to them until I hear from you after you shall have read this letter.

(2) The only writing between you and the parties above named is a letter from G.P.L. to D.M.& Co., dated March 25th. I880, stating that an arrangement had been made for D.M. &Co. to have sole control of your inventions in Australia &c., all expenses to be borne by D.M. & Co. and net proceeds to be divided as follows, thrity five per cent to D.M.&Co. (of which G.P.L. was to receive one-third) and sixty five per cent to you, the title to inventions and patents to be assigned to E.P. Fabbri and G.P.L. as Trustees, under trusts similar to England. This letter is all there is. No contracts appear to have been drawn, and nothing further appears to have been done between you and the above parties. Progumably the above arrangement covered your inventions relating to "lighting, heating or motive agent". Whether D.M. & Co. would have any interest in electric railways under this arrangement; is perhaps debatable, and there is no writing to settle it.

## [PHOTOCOPY]

- (3) Under date of October 2nd, 1891, I wrote a letter to Mr. Tate on this general matter, from which I quote as follows:
  - "pany have never paid any of hr. Ballaon's expenses touching experiments and patents for these inventions. Consequently, where is some reason to hold that they have lost their rights, and that Mr. Edison can pretty safely go shead and act on the Phypothesis that he alone owns Australia. As a lawyor, I cannot say that he may safely do this; but he, as a business "man, may conclude to do it and take his chances."
- (4) It would appear from papers in my possession that on March I, 1885, the Edison Indian & Colonial Company paid you. \$25,000, in money, plus 5,000 shares of A. Stock and 5,000 of B. Stock. Did any of this go to D.M. & Co. and G.P.L.? If so, the fact that you divided said receipts with them may be deemed to have given vitality and renewed life to the above mentioned letter of yards 25, 1880. But if not, have you ever down anything else to recognise the binding effect of said letter of 1880?
- (5) You may remember that your above mentioned agreement of warch I, 1865, with the parties of Tweeddale, obliged him and his assigns to give you, at your expense, exclusive licenses for relivary purposes under the patents which you had assigned purpuant to said agreement. Those licenses have been given. They were prepared so far as your interests were concerned by Mesans waterhouse, winterbotham & partison. The agreement privides that these licenses were to be given at your expense, and the above mentioned bill from that firm is to cover said expense.
- (6) Whether it is best for you to pay this law bill yourself without calling upon p.M. & Co. and G.P.L., or shether it is best for you to now call on them to pay it, and thus revive the old agreement of 1800 and thus acknowledge them as partners in your railway licenses, are questions for you to decide. If you decide to lat matters stay as they are, and not to revive just now the question of participation, please send me a bill of exchange made out as above.

## 1892. Electric Light - Foreign (D-92-26)

[PHOTOCOPY]

in going through the question of who may has title to your inventions and patents in different parts of the world. Re copplisations which I have resched touching Australia you may like to see. They are found in my report of July 39, 1802, entitled "Elison Fatents in Australiasia", a copy of which I cannot hereto; became our of it, and will probably most take thereafter to acquire your railway rights in Saustralia &c. That event would give a cash value to those linguises propared by the Waterhopse gay Pirm, covered by said bill of \$27,5000.

Will you kindly let us Made at your early conyour moves a profession you arrive at in this faster, because my firm owes a professional duty of sourtesy to two practs Solicitors, and should at least do them the fasor, in case their bill is not now po be paid, to tell them about

Very truly yours.

1892. Electric Light - Foreign (D-92-26)

[ENCLOSURE (PHOTOCOPY)]

Édison Australasian Patents

M: Catins (preliminary Report. July 30, 1992.

## 1892. Electric Light - Foreign (D-92-26)

[ENCLOSURE (PHOTOCOPY)]

EDISON PATENTS IN AUSTRALIA.

Mr . Baton's Report, July 30, 1892.

MEWZEALAND, HEW SOUTH WALES, VICTORIA, QUEENSLAND, SOUTH AUSTRALIA, TARMANIA, WEST AUSTRALIA, NATAL, CAFE OF GOOD HOFE and elsewhere in AUSTRALIA and SOUTH AFRICA and in INDIA AND CETION,

Who owns the Edison patents for the above countries?

The Brush Electrical Engineering Co., of London owns all patents and inventions up to June 12, 1887, for or relating to the "application of electricity or magnetism as a lighting, heating or motive agent". There is a possibility that this Company may be entitled to a six months' option upon inventions made subsequent to that date, but this is very doubtful and may be disregarded.

Are electric railway patents included in the above?

They are not. Under Mr. Edison's contract concerning the above territory, it is provided that he shall

STREET, STREET,

# 1892. Electric Light - Foreign (D-92-26) [ENCLOSURE (PHOTOCOPY)]

have a free and exclusive license for the use of all the patents for the purpose of "locomotion only, on railways or tramways or on common roads". That refers, no doubt, to patents or inventions which, like the dynamo, are susceptible of various uses, i.e., for instance, for ligh ing, heating and stationary power, as well as for railways. No mention is made of inventions which are solely and exclusively applicable to railways, and in view of the above provision regarding license, I am of opinion that Mr. Edison is entitled to retain the full title to all inventions relating exclusively to electric railways. Mr. Edison has received from the Brush Co. a free and exclusive license, under seal, to use for electric railway purposes all patents which he has heretofore assigned to that Company, all of them being of the class first men tioned above, namely, susceptible of various uses.

What title can a third party acquire?

As to all patents and inventions of a later date than June 12, 1867, Mr. Edison can, I think, give good and entire title. As to all of an earlier date, he can give good and entire title for inventions relating exclusively to electric railways, and can give a free and exclusive license for railway pur poses, touching inventions susceptible of various uses.

1893. Edison, T. A. - General (D-93-02)

Edward E. Quimby 59 Liberty Street New York Sept. 25, 189

Dear Mr. Dyer,

Mr. Matthiessen writes from Chicago that he will return to New York this week and will then call a meeting of the Weston directors and decide what is best to do about the arbitration.

yens Irvey Dan. A. Spinby.

To Richard N. Dyer, Esq.,

36 Wall Street, City.

moderation of methyd

Telegram;

Akron, Ohio. July 11th, 1898.

President McKinley,

Washington, D.C.

I have just received a dispatch that my son Theodore W. Miller, Troop D. Roosevelt's Rough Riders was wounded and died on the eighth. Can my son John V. Miller on Naval boat Trilean be detached and bring remains home if possible.

Lewis Miller.

Executive Mansion, Tashington, D.C. July 11th, 1898,

Mr. Lewis Miller,

Akron, Ohio .

Very deeply sympathize with you in the loss of your gallant son.

Have said to the Secretary of the Navy that this be done unless there is some commanding reason why your request can not be complied with.

Wm. McKINTAY

Cable

John V. Miller.

U.S.S. Trilion.

Playa del Este.

Cable particulars Thoodore's death; where is Dade Goodrich? Gardner Lowis EdiSon's special friend.

Lewis Miller

Telegram

Akron, Ohio. July 12th, 1898.

Hon. Secretary of the navy,

Washington, D.C.

Can you comply with the President's request to detail in the Ensign John V. Miller to bring home body of his brother Theddore W. Miller. Is there anything to be done by the family to accomplish this.

#### Telegram

Washington, D.C. July 14th, 1898.

Lowis Miller

Assistant Engineer Miller will be granted leave to take charge of remains of brother.

Crowinshield.

Cable

Playa Del Este, July 13th, 1898.

Lewis Miller, Akron, Ohio.

July first shot shoulder. Died Army Hespital Sibony. Will go there for information and obtain remains if possible. Leave all to us. Dade Well and with army around Santiago.

John

Cable

Washington, D.C. July 13th, 1898.

General Shafter,

officer to look after the details.

Thoodere W. Miller, private in Rough Riders, was wounded on the first and died on the eighth. His father, Hon. Lewis Miller, of Akron, Ohio, desires very much to recover his bedy. Casket will be placed on beard the first ship out of Hew York marked in your care. The sen who will take charge of the bedy is an Emsign and engineer ansigned to the Marblehead. If in your great strain of cares you can send for Mr. Miller when the casket arrives

I shall consider it a great favor. of course you will detail an

R.A. Algèr,

Secretary of War.

(z

Letter

Washington, D.C. July 13th, 1898.

My dear Sir;-

I doeply sympathate you in your great affliction, and will be glad to aid you all in my power to recover the body of your son who was killed in front of Santiago. This is the direction I would surgest:

Get casket plainly marked, with name of deceased on it, stating rask, company and rogiment, addressed to Major Genoral Shaftor, and placed in hands of Colonel Kimball, chief Quartermaster, New York. And this is the office that it be forwarded by the first ship.

Sincerely yours,

R.A. Alger,

Secretary of war.

Hon. Lewis Hiller, Akron, Ohio.

Tologram

Coast Signal Office

Washington, D.C. July 13th , 1898.

Assistant Engineer Miller,

"Marblehead "

care of Sampson, playa Del Este,
See Shafter for Alger's order, Coffin sent from New York, care
Shafter, embalm body. Address Edison 's

Father.

Letter

New York, July 14th, 1898.

(3)

This letter will be handed to you by the Hon. Lowis Miller, Akron, Ohio, who is desirous of procuring a casket for his son who died in hospital in Sibonsy, Ouba. Please have the casket addressed as follows:-

"Theo, W. Miller, Troop D., First Vol., Cav., Rough Riders." This casket and outside rough box to be delivered at Pier 3 East River, New York City, Markod "Caro gen, Shafter, Santiago de Cuba," and to be received by John V. Millor,

Respectfully,

Geo. P. Otis,

Purchasing Clork,

Q.M. Dept.,

Black Cloth Casket, Oval Top, Copper Lined, Trimmed, Handles Plate engraved, Pine Box
To be put on Stoamer, Pior 3, East River at 2 p.m. marked
"Casket for remains of Theo., w. Miller, Troop D., First Vol. Cav., 'Rough Ridors,' Care gen. Shafter, Santiago, de Cuba,"
To be received by John V. Miller, Assistant Engineer Ensign.
New York July. 14th, 1896.

Received from National Casket Co., (Lewis Miller)

For the remains of Thoodore V. Miller Troop D 1st., Vol. Cav. Rough Riders c/o Gon. Shafter Santiage de Cuba to be received by John V. Miller, Asaint., Engineer Emsign.

One (1) Burial Case on S.S. Berlin.

The State of the S

New York, July 15t

Engineer Miller, Marblehead

c/ Sampson, Playa Bol Este

Coffin S.S. Berlin today: telegraph route

tarting.

Pather.



Dear John:-

Everything has been in a disturbed condition ever since we got your first telegram about Theodore. I had hoped that we might have the remains of Theodore here by this time and worked with all possible efforts to that end; but your cable about the quarantine at Siboney makes it pretty definite that it will be some time before we can get Theodore's remains home. Of course that will also prevent your coming soon as we hoped you would. I enclose you copy of the different papers which will show you the efforts made at this end and all the arrangements that were made. I have been very thankful that everybody has been so kind from President McKinley down. They have done everything they could do for us. Sympathy has been extended to us from everybody. It has been a great shock. Day before yesterday we got a letter from David V. McClure who evidently was a cowboy and a man in Theodores squad; I enclose a copy of it; it shows how Theodore had won the heart of this cowboy. The same day we got a pocket memorandum book which Theodore had filled containing a full history of every days doings since he left New York which is very precious indeed. I will send you the "Beacons" which contain it almost verbatim. The "Beacon" people thought so much of it that they at once offered



(2)

to print the whole thing entire in their paper but it was so long . that after looking it over we decided it was best to print it in three sections instead of filling a whole paper with it. We feel the loss most deeply. I really gave him up when he entered the army and it was only a kind of second shock but it came so unexpectedly that we felt it almost as though we had not surrendered him when he enlisted. Mother and the girls were in New York at the time. Ed and I were alone at home and that is still the case. Mother is with Mina and the girls with the children at the sea-shore as arranged before you left. The girls are now at Minas again since they have heard the sad news. I am going to New York tomorrow and will stay at Mina's with mother over Sunday. I have some business in Connecticut Tuesday and go in advance so as to spend Sunday with mother. I have been surprised at the courageous way in which mother has received the shock. It was the morning when Mina brought us a new boy and it had to be kept from Mina. Mother would go out in the other room and cry awhile and then come back with cheer and comfort for Mina with her great burden. It was so from Monday until Saturday. When I heard the news I started at once as you will see from the enclosed with telegrams but not



(3)

resting satisfied with that I went to Washington and followed it of up until I had full arrangements made with Secretary Long and Secretary Alger and the President and the various Departments. I am very sorry the quarantime interferes but can appreciate how absolutely necessary it is to have it. I hope you will not necessarily expose yourself because of course now the body cannot be embalmed and we will get it home in whatever condition it may be in due time.

Laying aside this sorrow and grief, everybody is rejoiced at the great work the army and many has accomplished. There has been most wonderful rejoicing. The shops have been moving along and we got through wonderfully fine. The machines worked splendidly all the way through. Are now taking our inventory and preparing for another season.

We are watching every mail noping to get full letters from you about Theodore's last days, from the day he was wounded until the end. He seemed so hopeful on the 7th as you will see from the McClure letter and seemed to have such encouragement from those about him that we cannot understand just what happened that took him away so suddenly. The diary he sent seems to come right up



(4)

to the day he was wounded. It shows how readily he adapted him- self to all his surroundings, how he was beloved and worked himsolf into the good graces of all, even to the Colonol.

I will not go to Europe unless later on. Am making my first work that of looking after my family. We do not understand your first cable that you were transferred to the boat "Trilion" or "Trileas". I could find no such boat on the navy yard records in Washington. Is it the tug "Triton" or the repair ship "Vulcan"? the cable was probably "bulled" in some way. Also you say Gardner Lewis is the commanded; is it Gardner Sims? Have had no letter since you got to Santiago and are looking for one daily which we hope will tell us just how you are situated.

Father.

July 22nd; Your father went east this noon; I will mail the "Beacons" tonight. I think your father will go to Europe. He is waiting to hear how long it is likely to be before you can bring Theodore's body back. Tom Marshall dropped dead of appplexy Probably at six o'clock this morning. All the boys here have by asked to be remembered when writing to you. Walt.

my dran me miller

representation of maj Labarde that all of your brothers effects have been destroyed with the general order issued by the department at washington the object y which was to promit any possibility of fever infection getting oil y Dibrary. The ceramony at his formal was conducted by the Desplain who is stationed at the hospital. I cannot neall his name. The

2

grave is on the hillside back y Diboney. On you approved Diboney from the sea you will see a path leading up the hill to the west Half way up this hill in a blockhouse or the chancel ruins of a blookhouse so you cannot mistate it. at the top of the hill there are the grams of the were who full in the fighting near that you must be auticage. Four brothers is the first, on the left hand side of the road. There is a food at the foot makish is

printed his full name at the heady the grave not more Them a foot from the surface in a fattle in which are the details of his track wounding and death and descriptions by which his identification at my time is cutain. I ruguind about the bodin of Hamillion Fish and Capt Capun and was informed that they had been disintered and out home. Dysupattizing with you in your affliction I am sir Jours Very truly

I Chambrali



AKRON. OHIO. Auguat 1st, 1898.

Dear John: -

Dear John: I have been so full of grief and feeling sure you would soon be with us bringing Theodore's body I rwally have neglected writing you use the however the product of the state of

side him and heard what McClure had written and what Dr. Loser said and he said he did not understand why they should write that way when Theodore was so seriously wounded and so Teeble. I saw that way when Theodore was so seriously wounded and so Teeble. I saw the wounded and sick, he having been one of the sick. We found him on the steamer and afterward had him come over to Orange and dine with us one, wouning. The girls and mother had a nice talk with him. He said he talked with Theodore and Theodore was a litter that when the same money and told him that Gapt. Houston had there were not to the same that the same money there somewhere so that, if you can get communication with Gapt. Houston you could probably get the money. In addition I would get all his effects together and send home such things as you think proper. Knot says the Chaplain came to him and asked him about theodore after Theodore had died and he gave him his same, regiment, etc and that the chaplain wrote if down him his man, regiment, etc and that the chaplain wrote if down also put a shingle at the head of his grave with the inncription. I have this morning a letter from Capt. Feederle which states still more about Theodore's grave. There is one great consolation and we all rejoiced in our grief that we have so full information about Theodore in the field by four men desciled for the purpose. I have

I have this morning a letter from Capt. Feederle which states still more about Theodore's grave. There is one great consolation and we are all rejoiced in our grief that we have so full information about Theodore and the care he received after he was wounded. He was carried off the field by four men detailed for the purpose. I have their names but not here at the office.

It is just possible that if you had a few immunes who are not subject to yallow faver they could go there and get the body by special order from Cen'l Shafter, then have the offin thoroughly the charter of the country of the country of the country is a subject to yellow faver they could go there and get the body by special order from Cen'l Shafter, then have the offin thoroughly the charter of the country of



fact the same pattern as the coffin that Fish took with him down there. After the body is in the coffin and hermetically sealed, there can be no danger from that source and the only danger there could be would be the outside of the coffin which certainly can be furnigated to make it entirely safe to have it placed on board be Immagated to make it entirely said to make it placed of board a ship. I think if this was done by immunes, you might be able to come home with the body. Consult Capt. Sims freely care follow his advice and do nothing that will endanger you in any may, because now that we have lost Theodore the great care must be for cause now that we have lost inecomore the great care must be 107 the living. We hope you will return in perfectly good health. We are all glad you are on the ship "Vulcan" and from our impressions of that ship think you have got a great opportunity especially so long as you are with Capt. Sims who will certainly take great interest in you. It certainly may not be quite so exciting as to be on a regular war ship but you have an opportunity to see al that is now to be seen in the way of naval engagements and your ship must be more or less active all the time.

We are all bearing the grief with remarkable fortitude. Jan is probably the most heavily affected. Mina bears it remarkably well and lives in the many pleasant memories that Theodore has left in all his active life and she does not mourn over what is now unavoidable. Jane takes it to heart and it is hard for her to give VALEDIAN. SERIE SERVES IT SO RESET ARE 12 IN REF 107 REF TO SEVE UP. MOTHER has borne it wonleyfully well but has finally been worn out with Mina's care and the grief and had quite a little time in the way of dysentery. She has sette so little it has made her quite weak. I brought her home from Mina's arriving here last Priquite weak. I prought the nome from anne se arrang note tage that any morning. She was quite comfortable on the way coming home but since then she has kind of let kown and we had to keep her in bed. Oct a nice nurse for her and she is scling well. She thinks she can come out today but we are persuading her to stay in a few days more and hope she will, when she will be herself again. The girls remained in New York and will stay there for a few weeks and then they will come home.

they will come home.
Harvest here is just about over. Have a little out-cutting
this week when I will be through for this year. Am going to Chautauqua tomqht and will is stay there a couple of days and then comeback again. All send their best wishes and great love to you amhope you will return well and happy. You must the intended on the
good life. The diary is such a confort to us. Experience of the conformation that
great deal to comfort us. We must be happy in the reflection that
Theodor's life was a noble one and he is now in the better country.
The conformation of the conformation of the conformation of the conformation of the conformation that
Theodor's life was a noble one and he is now in the better country.
The conformation of the conformati

New Gook City December - 19th 98

Thomas a. Edison. Eg. -Orange - N. J. Dear Pir -

I am at was to understand

why in every case thave writters to you regarding anything whether of a business mature on a personal one - that you should employ a representative to communicate your opinions on purmises instead of addressing yourself to me personally - however understand this is one of your characteristics and its motive perhaps can be underatood later on -

To have justified reasons compelling me to communicate The following remarks to you is indeed a somowful ending of affairs - and is a deep curse to us both - from not only

one but every point of view - ) worked for you faithfully and obediently until was actually compelled to leave the best friend 1 Thought I had - but now as I look back whom Those days - what an aco-what a fool I was to devote my time to a man-whose domestic allentions are foreign. to him - and who has no mone night in this world to be a father Than a youth of pix-

That time was waste- absolute waste - but punce Heft you - I know more - than if I had been associated with you forty years - you have tried to down me



which is indeed - indisputiable - but with all your imaginative cureesaful endeavors - whall prove - that your influence with the outside would is nothing with a public that is with the youth.

If in your opinion based upon facts gained from mon you have paight to ascentain the truth. I have disgraced you and your family wait-you will think I have been an angel before many days pass by for I have death with you as a father and not as I shall do hereafter-tike an ordinary individual.

I give you full enedit - so does the world - for your workderful achievments towards the advance, of science- but the public know as well as in you cannot down an adjusent for the same honors bestowed upon yourself no matter who he is - whether his mame be Edwar on smith

where you have lost money - I propose to gain it and I have not and am not prosong as the inventor of a single thing - bearing my mame to day - this is my method of learning business - and if I do originate any useful article - I will know how to handle it four phould have been ask any today "a millione ten times over if you know how to handle your own achievements - what have your to day ask the financial world - they know to day ask the financial world - they know

Thave no desire to enter into any arguments with you on anyone close so I shall not say

anything in answer to your refresentitivis letter received yesterday afternoon further than to say that I would not use your name unless I had your permission but the enterprise regarding the proposed show our exhibit of your application throughout the country and which a poke to your about - shall go on just the same as ever-

you pay you have got enough of me-very well-perhaps it is just as well for you-but I shall deal with you-man to man-and not father to son- let this be understood mow and for ever-

The world will go on just the name-lobal go on just as I have been down quarted the law only compello me to stop - then I must stop - not before -

pour name has been a detrument to me from the day I started out and always will be where would I get any credit? no where what ever I get up and will get up in the future you are and will be the inventor and you have given it to your boy to go ahead ask anyone in the unimage.

of this is not the ofunion - I If your name was worth courthing to me why have I not money to day? why haven't men there so called scoundado the very men who would make money out of your name why having they made money? If your name was worth anything? It is not people are through pulling money into your inventions and so a consequence they are through with the name of Eduson for good - otherwise I would be a pich man-

If my name was smith-I would be a rich man to-day and I propose to have it changed having sufficient reasons that the low will grant my request.

When I asked you to endorae a note for me-and take those worthless papers backs which were given me-when I was an import in the hands of the law-do you sufficed for one minute I thought you would do it? no indeed I did not think of such a thing-once - I gave you that money because you were in need of it at the timp-I did to willingly - I did not have to do it - and this is what I get in return-some one will feel sonny - but I shall get the full amount you took from me - and get it very guel.

### 1898. Edison, T. A. - Family - Edison, T. A., Jr. (D-98-07)

as I do not care to have such monsense

verytraly Thomas a Edison / P.S. lunderatand you think I have got a bighead if you reason it dut you will come to the cornelisation. that I have done nothing on accomplished anythe that would in any way give me a highead consequently it is reducibles.

as to marrying - that concerns no one but myself

1898. Edison, T. A. - Family - Edison, T. A., Jr. (D-98-07)

Calle Address	
"Edison, New York"	

Thom the Laboratory

PHONOGRAPH DICTATION.

Drange, N.J.\_\_\_\_\_\_\_\_\_18,

Hather makes for me to say in answer to your letter that he class not want your to go around the country resident for more as a decening cardiand by your ottempt to do so be will send a lamper in to stop it. The old morn source him is inverged, with your and that your lame also graced him is inverged, who he was your that your wife in all the more for interfered that he way for home to so much for that or that way your home towards and for and a much for that or the way you have treated him and lived to him. I want to be bad an opinion of jour

Trusting you one much better I am your loving wrother

Rill But, a. E.

## 1898. Electric Light - Edison Electric Illuminating Company Of New York (D-98-15)

### **ГРНОТОСОРУ**1

# The Edison Electric Illuminating Company of New York

General Offices, 53, 55, 57 Duane St.

COMBINE	D EARNINGS, J	и г. у, 1898.	
(Incl	usive of High Ter	nsion System.)	
	-		
with a control of	1898	1897	Increase W
Gross Earnings Operating & General Ex	\$ 196,400.50	\$ 162,453,48 \$	33,947.02
penses, incl. Taxes	112,348,20	91,418,98	20,929.22
Deprec'n Charge	17.500.00	12,000,00	5,500.00
Net Earnings	66,552.30	59,034.50	7,517.80
Accrued Interest on Be	onds 27,075.00	27,075.00	100
Capital Stock	9,077,000,00	7,938,000,00	1,139,000.00
Mortgage Bonds	6,500,000.00	6,500,000.00	
	•		
			蒋
	Edison Co.	Manhattan Co	Total_A
Gross Earnings \$	160,655.21 8	35,745.29	8 196,400.50
Expenses	102,485.02	27,363,18	129 848 20
Net Earnings	58,170.19	8,382.11	66,552.30
Not burnings	•		
	RETURNS FOR 7	MONTHS.	4. 1539
	1898	1897	Increase
	1090	1091	Increase
Gross Earnings	\$1,738,123.	46 \$1,391,219.79	\$ 346,903.67
Net Earnings	751,760.	07 630,749.02	121,011.05
Interest on Bonds	189,525,	00 189,525.00	100
Sales Services			100
	Edison Co.	Manhattan-Co	Total
Incon Lamne 16 c n			1

Motors H. P., number Total 16 c. p. equiv.

## SUPPLEMENT

**MISCELLANEOUS LEGAL FILE** 

**LEGAL SERIES** 

#### [THIS EXHIBIT IS PART OF THE 1888 CONTRACT BETWEEN EDISON AND HENRY VILLARD ON REEL 145, FRAMES 276-282]

#### EXHIBIT "A".

1. A Cotton Picker, to do for cotton what the Mowing Machine has done for serials.

A great number of experiments have been made with the view of producing such a machine. The demand for such a machine is very great and I have frequently been requested to experiment with the view of inventing such a machine. I have conducted a number of experiments and believe they will result successfully. I expect to build a small experimental machine this summer.

2. Apparatus for deaf people, to increase audition.

I have been working on this for eight years, and have received not less than 10,000 inquiries concerning the progress of my experiments. I believe I can perfect such a machine.

Improved Battery for General Service.

The sales of batteries in this country amount to over a million dollars annually. They would be three times as large if a good battery could be obtained. I have conducted a number of experiments on such a battery and believe I can perfect one.

4. Increasing the speed for Signalling of Submarine Cables, to permit the use of a Cable direct from New York

#### [THIS EXHIBIT IS PART OF THE 1888 CONTRACT BETWEEN EDISON AND HENRY VILLARD ON REEL 145. FRAMES 276-282]

to London at one third of the present cost.

All the conditions of cable signalling are well known and point to a certain direction in which to work. I have conducted a number of experiments on this subject and believe they will result successfully.

1012

5. Electro-deposit in high vacuo, for commercial use, to replace the present electrotype, system.

At the present time there is probably envested in this country in the electrotype. Industry over Five Millions of dollars. If I could perfect the process upon which I have been experimenting and have in mind, its value would be very great.

3. Artificial Silk.

For the past eight years I have at different times conducted a number of experiments, with the view of making silk artificially. I feel quite confident from the experiments I have conducted, that I will be able to make silk artificially. It will take considerable time however to perfect my work in this direction. The value of such a process would be enormous.

Makleablizing Cast Iron cheaply.
 Could the time be reduced, required in malles-

## [THIS EXHIBIT IS PART OF THE 1888 CONTRACT BETWEEN EDISON AND HENRY VILLARD ON REEL 145, FRAMES 276-282]

blizing iron, from one week to a few hours, the saving in this country alone would exceed for Hilllions of dollars. I have conducted a number of experiments on this subject. The results are very satisfactory and I am continuing them.

8. Drawing fine sizes of brass wire and sizes where there are forty per cent duty.

Forty thousand pounds or such wire are used in the United States wookly. Gould it be manufactured here a great saving would be effected. I am now making an apparatus to do this work and from the experiments I have heretofore conducted, I am sure the process I have in mind will prove a success.

9. Snow pressing machine for cleaning streets.

I have tried the preliminary experiments and have made the complete working drawings of my invention for this purpose. It does Now York City over \$50,000 to clear the principal streets after each snow storm of six inches fall. A machine drawn by six horses sweeps up the snow and presses it into square blocks of ice as the horses walk. This enables the earts to carry four times the loan they do now. The blocks can be temporarily

## [THIS EXHIBIT IS PART OF THE 1888 CONTRACT BETWEEN EDISON AND HENRY VILLARD ON REEL 145, FRAMES 276-282]

piled up in the gutter as paving blocks are now done. Such a machine wouldgreatly reduce the cost of belearing the streets from snow, according to the methods now practiced.

10. Refining Copper Electrically.

I have conducted a number of experiments on this subject, at the request of the Parrot Copper and Silver Company. The yearly output of that company is Three Millions of Dollars, and each ton of copper contains \$65. in silver.

- 11. Cutting Ice and Wood by Electricity.

  This is an old idea, but I am trying to make it practical. I believe under proper conditions pine, lumber trees, and other large standing trees can be out for much less money by this process than any other.
- 12. Manufacture of cheap Bolting Cloth.

Bolting Cloth, as now marmfactured, is made of silk and sells for from three to four dollars per yard. I have a method of cheapening it, which I believe will prove successful.

15. Manufacture of Sheet Glass and Tubes.

My work in this direction is entirely original and if successful will completely change the

#### [THIS EXHIBIT IS PART OF THE 1888 CONTRACT BETWEEN EDISON AND HENRY VILLARD ON REEL 145. FRAMES 276-282]

present methods of working window glass and will be very valuable.

14. Artificial Mother-of-Pearl.

I have been working on this for some time and have obtained fair results. I have and can produce surfaces on metallic foil as cheep as newspapers can be printed. The Morther-of-Pearl pur-

face can be given to a sheet of metallic foil as cheaply as a sheet of paper can be printed from a

block of type.

I have about perfected this invention. This ink is now imported and solls at quite a high price. By process of menufacturing it is a very chesp one and will result in large sales in this country.

16. Ink for the blind.
This is an ink which on contact with the paper swells up onormously and hardons. From my experiments, I believe this invention will be perfected.

17. Regenerative Kerosene Rurner...

I have conducted some few experiments on this and have obtained fairly good results.

18. Coal Sorting Machine.

at an early day.

#### [THIS EXHIBIT IS PART OF THE 1888 CONTRACT BETWEEN EDISON AND HENRY VILLARD ON REEL 145. FRAMES 276-282]

This is an extremely difficult invention to make, but if a mechine which would nort scal could be perfected, its value would be very great. I have conducted a number of experiments on this subject and with promise of good results.

#### 19. Butter Direct from Milk.

The large butter-waking Machine Companies have repeatedly communicated with me, requesting that I take this subject up. I am informed the dairy industry in this country represents \$650,000,000 annually and that the present processes used in the great creamery entablishments are very bad. I have been tryin; some modern ideas on this uppet and believe I can produce something very valuable.

#### 20. Artificial Ivory.

I have been making this for some thirteen

years past, at intervals. I have perfected nothing as yet, but believe that ultimately I will

succeed,

#### 21. Magneto R. R. Signal System.

I am conducting experiments on this at the present time, with promine of good results.

#### 22. Electricity Direct from Coal.

I have at the present time twelve men at work

#### [THIS EXHIBIT IS PART OF THE 1888 CONTRACT BETWEEN EDISON AND HENRY VILLARD ON REEL 145. FRAMES 276-2821

on this subject and I have obtained some excellent results. A practical solution of this problem will change the entire motive power and lighting of the world. The value of such an invention would be almost incalculable.

## 23. Decarbonizing pig iron electrically.

I have conducted many experiments on this subject, but have some idea which I think are of value, and propose taking it up at once.

## SUPPLEMENT

SCRAPBOOK SERIES

#### Scrapbook, Cat. 116,993

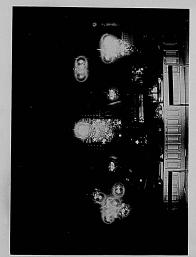
This scrapbook covers the period April-May 1884, with a few additional

items from May 1896 and August 1909. Included are typewritten transcriptions of local newspaper reports, editorials, and advertisements relating to the exhibition of Edison's inventions at Mechanics Hall in Worcester. Massachusetts, on May 1-2, 1884. There is material pertaining to a visit with Edison in New York prior to the exhibition, as well as photographs of Edison's exhibit and descriptions of Edison, Sherburne B. Eaton, and Edward H. Johnson at the event. A series of illustrations in the middle of the book contains views of the sites shown to Edison and his party while in Worcester: the Mechanics Hall, the Antiquarian Society, and the Natural History Society: the Worcester Academy, Worcester Polytechnic Institute, and Clark University; and various manufacturing establishments. At the end of the book is a transcribed article from the Worcester Sunday Spy (1896) relating to an interview with Edison at the West Orange laboratory, along with a clipping from the Boston American (1909) containing images of technological and racial supremacy. The scrapbook was compiled by W. H. Raymenton, president of the Worcester Natural History Society and an organizer of the exhibition. It was presented to Edison in 1916 by Raymenton's son. The cover is stamped "Edison - in -Worcester - 1884." The spine is stamped "Edison in Worcester Electrical Exposition 1884." The pages are unnumbered. Approximately 120 pages have used

Themas A.C.dison. From M.St. Raymenton,

Stage of Mechanics Hall. Edison Electrical Exposition Maylst and End 1884. Electric Lamps Unlighted.

Stage of Mechanist Prestant Lamb edministration . The United Anticonstruction of the United States and the Contract of the United States and the Contract of the United States and the Contract of the Contrac



Stage of Mechanics Hall.

Edison Electrical Exposition May 1st and End 1884. Electric Lamps Lighted.



"He threw double sevens"

EDISON IN WORCESTER.

A compilation of the Newspaper Articles published at the time of the Electrical Exposition of Thomas A. Edison

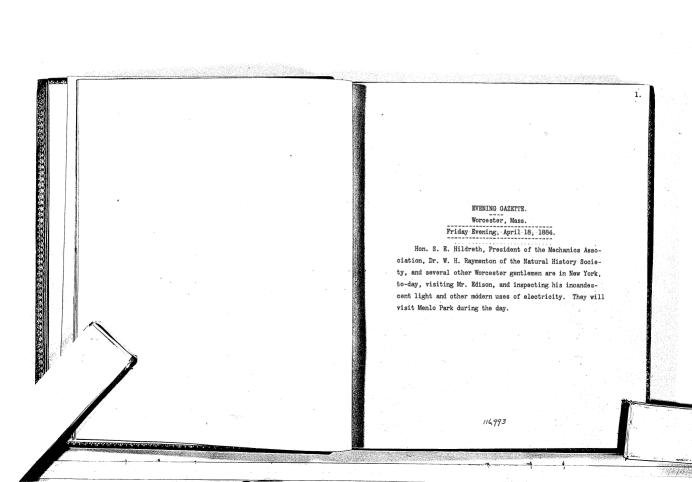
Worcester, Mass.

May 1st. and 2nd. 1884.

With illustrations of the buildings visited by Edison and Party.

Compiled by
W. H. Raymenton,
President of the Worcester Natural History Society,
Worcester, Mass.

1884.



WORCESTER DAILY SPY.

The President of the Mechanics' Association, ex-Mayor Hildreth, and the President of the Natural History Society, Dr. Raymenton, with several other Worcester citizens, have been in New York for the past two days, inspecting, under the guidance of Prof. Thos. A. Edison, the latest modern uses of electricity as applied to lighting, motive power, domestic and other purposes. Yesterday they visited Edison's laboratory at Menlo Park and saw the electrical railway, the original phonograph, and the thousand and one modern appliances of the coming power, electricity, and other inventions of Prof. Edison. They also arranged with Edison to visit this city May 1st and 2nd.

EVENING GAZETTE.

Worcester, Mass.

Tuesday Evening, April 22, 1884.

MR EDISON IN WORCESTER. There is general congratulation and interest over the success of the managers of the Mechanics' Association and the Natural History Society in securing an engagement of Mr. Edison, the famous electrician, to give two Lecture Exhibitions here, of his latest discoveries and inventions. They will be given at Mechanics Hall on Thursday and Friday evenings of next week.

Mr. Edison will take personal charge of his exhibit, and has promised to bring with him from New York several of the original models of some of his famous inventions, as the duplex telegraph, the gold reporter, the phonograph, and his electrical locomotive engine, also his wonderful new invention, the electro-motograph, an instrument by means of which, tones can be sent through a telephone wire, and reproduced loud enough to be heard distinctly in the largest half. This is something entirely new, and never heard before in Worcester. He will also bring his improved pho-

nograph, which repeats in the most distinct and remarkable manner, whatever may be said of it. Profs. Eaton and Johnson of New York, eminent electricians, will explain in the most practical and clearest manner the latest facts and discoveries in the application of electrical power to practical use. Arrangements have been in progress for many weeks, and the exhibition will be, undoubtedly, an unqualified success. It is a most notable event to have such a man as Edison visit the city for such a purpose, and too mach credit can not be given to the perseverence and hard work on the part of the gentlemen who have made it possible for the public to enjoy the treat in store for them.

# EVENING GAZETTE. Worcester, Mass. Wednesday Evening, April 23.

The representatives of the Worcester Mechanics Association, and the Worcester Natural History Society and the gentlemen who accompanied them in their recent visit to New York, on the matter of the forthcoming electrical exhibition in this city came back vastly delighted with their visit and its success. They were received with great courtesy, and as a very rare privilege, were given a tour of inspection through the manufacturing premises of the Edison com-are employed giving practical force to Edison's inventions, the number of which is legion, for it would seem that at any and every point in science or mechanics to be bridged Edison's genius opens the way. The whole tour through these works was a procession through marvels of discovery, the fruit of which is coming to the world in the electric light and wonders of applied electricity only just now beginning to be appreciated. The Worcester party passed two busy days in New York and are now at work pushing actively the

preparations for the great exhibition which owes its inception to President Raymenton of the Natural History Society, with whom are co-operating fully the best forces of both organizations.

WORCESTER DAILY SPY.
Wednesday, April 23, 1884.

Mr. Edison, in an interview, tells a reporter of the New York Mail and Express that his incandescent light is in full operation in thirteen cities of the United States, while seventy or eighty more are preparing for its introduction.

The electric locomotive, he thinks, has a great future, but he doubts whether it will ever supplant steam on the great main roads. The problem which is exercising his mind at present is that of a cheaper source of electricity, or to put it in another form, a way to use coal more economically as a source of power. "We want, "he says, "to get electricity from coal direct, without the intervention of boiler and engine. A good many people are at work on it. We don't see our way at all to it, but I will say it is surely possible. Zinc and other metals we can get into electricity at once, but the trouble is to do that with coal and carbon.

If we could, we would get six horse power from one 1b. of coal, while with the boiler and steam engine we get only

one horse power from three lbs. of coal." If that can be done, the world will owe a heavy debt of gratitude to the man who brings it about. There seems to be no essential impossibility in the way, and the progress of invention has made many things familiar and commonplace, which, half a century ago, seemed more improbable than getting electricity direct from coal seems now. (Editorial.)

EVENING GAZETTE.
Friday Evening, April 25, 1884.

# IN EDISON'S LABORATORY.

To the Editor of the Gazette: The happy audacity with which the Worcester party, who recently visited Mr. Edison, captured him, end in spite of his decided and reiterated negative took it for granted that he would come to Worcester and make their lecture on the practical uses of electricity round and full by the presence of the first electrician of the age, and would take nothing but a positive yes for an answer, seemed to please, if not amuse him, and he allowed himself to be captivated by the earnest plea of the spokesman of the party, who, not speaking by note or by rote but by main strength, quite took him by storm, and accepting the invitation and ta-

king in the situation, he at once with great good nature, placed himself entirely at their service, and began at once to plan as to the best way to make a successful exhibit.

When once enlisted, nothing could have been more cordial and helpful than his manner and suggestions, and he run their cup of gratitude full to overflowing when he gave an order to the General Superintendent to pass the Worcester gentlemen through the laboratory and workshops; a most unprecedented thing for him to do, as was afterwards learned, as many of the processes are only in their experimental stage, of course unpatented and therefore have to be most jealously guarded.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

To enumerate all the various instruments, inventions and work going on in his laboratory would fill a book and I have here only a leaf from the record of my memory. On a table were the works of the famous gold and stock reporter exposed to view. In the center of the room was the improved phonograph whose wonderful powers we were soon to learn.

The marvelous megophone by which you could hear the rustle of a man walking through the grass or a cow chewing her cud in the meadow a mile and a half distant; the various appliances for the improving the sending of telegraphic messages; the ingenious multiform writing leaves; the specialized electrical incandescent lamps for domestic, mechanical and surgical purposes. For instance, the mild, soft light by which a lady sits and reads by night, means so much power; the way by which this can be applied has been discovered, and by an ingenious instrument attached to a sewing machine the same wire which is attached to the electric lamp can be unscrewed and connected with the sewing machine and run it, thus giving light by night and power by day.

The surgical lamp enclosed in an air-tight tube hangs the carbon filament glowing but only slightly warming the glass; this is passed into the throat for examining the organs there; the dental lamp, a miniature lamp about the size and shape of one's thumb nail, flat and about one fourth candle power which is placed in the mouth for spacial dental work, electrical jewelry on the same general plan, the unique electro motograph or loud talking telephone. But we were specially cautioned not to "give away" all we saw and I am getting on dangerous ground where "I burn." Perhaps, however, Mr. Edison will bring to Worcester some of the things I have not mentioned. If he does not it will only be because he was not asked for he certainly promised and gave all that the Worcester party did ask him, and they were not at all backward in coming forward with their requests, as I think will be quite exemplified when Mr. Edison arrives with his exhibit. (W. H. Raymenton.)

# REFERENCE

An Illustrated Lecture

MECHANICS HALL.

Thursday Evening, May 1, 1884.
Under the auspices of the
WORCESTER COUNTY MECHANICS ASSOCIATION

and

WORCESTER NATURAL HISTORY SOCIETY

Electric Motors, Electric Motograph, Electric Arc Light, Edison's Electric Incandescent Lamp, Edison's Original and Improved Phonograph, Edison's Loud Speaking Telephone, Will Be Among The Wonders Of The Exhibition.

THOMAS A. EDISON,

The World Renowned Inventor and Electrician,

Will be present and take charge of THE ELECTRICAL EXHIBIT.

The Modern Uses Of Electricity
Will be illustrated and explained by eminent
Professors and Electricians of
world-wide repute.

ELECTRIC MOTORS,

For manufactory and domestic purposes,

ARC LIGHT and INCANDESCENT LAMP,

All seen in full operation.

Tickets with reserved seats, at 25 cents and 50 cents, can be obtained by members of the Mechanics' Association at the Box Office, Mechanics' Hall, and by members of the Natural History Society at the Museum, Foster St., on Monday, April 28th, from 9 A. M. to 9 P. M., and by the general public on and after Tuesday at Putnam & Davis'.

WORCESTER DAILY SPY.
Saturday, April 26, 1884.

THOMAS A. EDISON.

An interview with Mr. Edison cannot fail to impress one with his very notable peculiarities. He is entirely unaffected in his manner and very direct in his conversation. He appears to be more eager to learn than anxious to impart, and immediately comprehends the full measure of what is said after which he does not rehearse and descant upon the theme, nor appropriate the idea in his own language, but manifesting his assent passes on to other topics. In this respect Edison is like Humboldt, who was too great a man to affect superiority and too keen sighted to require lengthy explanations.

S. S. Jr.

Stophen Salisbury. Jr.

### "THE WONDERFUL LAMP. "

。 《《《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"《文学》:"

The story of Aladdin, or the Wonderful Lamp, marvelous as it reads in the Arabian Nights tale, but exemplifies the old adage that "The truth is stranger than fiction." when compared with the modern story or statement of facts of Edison and his wonderful lamp. Aladdin's palace was but a magnificent toy, with its banqueting hall and the "four and twenty bejeweled windows." where the idle hours were passed in passive pleasures, served by soft footed slaves, amid song and feasting, flowers and wine, where, on couches of blue and gold spangled with silver and sown with pearls, inglorious laid, the prince of the eastern tale lived selfishly at his ease through all his useless, dreamy, petty life. Compare with this the surroundings of the hero of our western tale, Edison, the world renowned inventor, as he may be seen in his office palace on Fifth Avenue, New York, the centre of a score of active agents with busy brains, executing the plans and purposes of the central thought, which we see realized in the great workshops filled with a thousand men, skillfully working out in tangible and useful forms the original ideas of the master, which give new light and life to the world, and are ever increasing boons and blessings to our race.

But I commenced to write of the "Wonderful Lamp" that I saw in Mr. Edison's business office. Suspended over the desk in the office is an immense Japanese umbrella, projecting from whose rib lips are 20 B or 8-candle power lamps. which are equivalent to ten 16-candle lights. Depending from the umbrella handle, and four or five feet above the desk, is a Bergmann artificial flower electrolier, with 9 16-candle lamps, wreathed in among the flowers in vari-colored bell-shaped shades. The flower globe is of white glazed porcelain, rising from which is a shaft of gold colored gas piping one inch in diameter, which was substituted for the umbrella handle below the braces, and the whole setting decidedly artistic. Inserted in the floor, just inside the keyhole of the desk, are two switches worked by the feet, the right hand switch turning on or off the current to the rib lip lamps, and the left one performing the same office for the electrolier lights, the extinguishing being done by pressing out a spring, and the lighting by pushing in a metallic button. The effect is magical, and a source of great wonder to the uninitiated. Several feet to the right of the desk, but in the same circuit with the umbrella lights, and affixed to one of the uprights of the building, is an ingenious electric cigar lighter, devised by Mr. Edison. The connection is made by grasping the handle of

the lighter, the bars of platinum therein glowing with a bright red heat sufficient to light eigers and cigarettes. The current is broken by releasing the lighter. The setting and workings of the light at the Edison office form one of the most attractive sights, and one might fairly consider himself an occupant of a palace more marvelous than Aladdin's, so wonderful are the workings of the system.

W. H. Raymenton.

EVENING GAZETTE.
Saturday Evening, April 26, 1884.

"THE WIZARD OF MENLO PARK."
Edison and His Work.

The genius of the past and present is no more strikingly typified than by the contrasted pictures of the mediaeval "Wizard" and the modern wise man, the ancient conjuror and the inventor of to-day. The one, robed in solemn black, surrounding himself with a hideous paraphernalia of skulls and crossbones, striving to impress his credulous dupes with the idea that he is in league with the prince of darkness, endowed by him with magic arts and occult powers for working weal or woe

on the bodies and souls of men, mumbling his mystical formulas, appeals to the superstitious and fears of the ignorant. The other, the wonder-worker of to-day, despising all mystery and its adventitious aids, standing forth in the broad light of day, speaks only to our reason, asks us not to admire or marvel at his skill, but to accept and use the blessings which are given the world. How marked the contrast, the 9th and the 19th century. The magicians of to-day are many, but preeminent among them, embodying in himself the inventive spirit of the age, stands Thomas A. Edison, the wizard of Menlo Park.

The party of Worcester gentlemen, who had the privilege of meeting Mr. Edison last week in his laboratory, and under his guidance of visiting the extensive works where hundreds of busy brains and hands are employed, carrying out his plans and ideas, and where he is the inspiration and the head, were all much impressed by Edison, the man, and amazed at the tangible results of his labors. Menlo Park, so celebrated at one time as the Mecca of the savant and curiosity hunter, was but the nurserery where was grown the plant, which, transmitted to New York city, has developed into the scores of busy workshops, where the conceptions of his brain are materialized and translated into imperishable speech and living light.

The improved phonograph, which records with perfect accuracy the tone, quality and personal character of each individual human voice, and which can be preserved indefinitely to be reproduced as perfectly as when uttered, be it a thousand years hence, is the most marvelous invention of the age. It is ne wonder that Mr. Edison regards it with peculiar pride and intends at no distant day to give it a dower of practical usefulness, the possibilities of which are not even imagined save by its inventor, who holds in store till his own good time this royal gift one day to be presented to the world.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Another of the marvels of the age is his incandescent lamp. But yesterday, as it were, the scientists of Europe were demonstrating, on paper, the impossibility of dividing the light, or making practical use of the invention.

When the critics had shown this end to be unattainable, and the utter futility of all effort, Edison quietly turns on the current and the carbon filament glows with a most convincing argumentam ad homingin, and its wonderful simplicity makes one marvel that none but a master should have discovered it. But it was the master and king of discoverers who demonstrated that it is almost as easy to make an egg stand on end as to discover a new world. These are but two of the many wonderful children born of the fertile brain of Edison, the inventor. As we passed through his busy workshops, we

were constantly made alive to the fact that "there are more things in Heaven and Earth than are dreampt of in our philosophy."

Of all the objects of interest in and about Menlo Park. with none were we more profoundly impressed than Edison himself. A young man, only 37 years of age, smooth faced, simple in appearance, active, energetic, intense, a business man, plain in dress and speech, frank, cordial and generous. his methods open as the day, the heart of his mystery honest inquiry and implicit faith in the unchangableness, truth and benificence of the laws of nature, with a healthful optimism which gives him courage and strength to attempt the solution of the scientific problems propounded by the sphynx like spirit of the age, allowing no such word as fail, and knowing no rest till the riddle is read or the Gordian knot untied or cut. Thomas A. Edison stands to-day the foremost inventor and discoverer of the age in a realm of wonders, into which our own Franklin but looked as into a land of promise, teeming with benificent bounties for the amelioration of the condition of our race, the possibilities of which he could not see or imagine.

Amid detraction, calumny, extravagant laudation, bitter hostility of enemies and the often injudicious partisan-

ship of friends, he has modestly, perseveringly and successfully held on his way, till now he stands the leader among leaders in his special field of labor. We were impressed most vividly by his direct and comprehensive grasp of a subject, his quick appreciation of a point, his intense and absorbing interest in the special topic under consideration, as one possessing an elephantine strength, but light and graceful as the swallow in the exercise of it, with an intellect quick and clear as light, swift to perceive and act.

en en de les transces de la grandada par que en la grandada de la grandada de la grandada de la grandada de la

The visit of Mr. Edison to Worcester in the near future' and the exhibition of his "wonderful lamp" and other remarkable inventions under his own personal supervision is a notable event, and reflects great credit on the management of the Mechanics' Association and the Natural History Society who have made it possible for the people of Worcester to enjoy the rare privilege of seeing the foremost inventor of the day in the midst of his works.

W. H. Raymenton.

Gazette, April 26, 1884.

The programme of the illustrated electrical lecture and Edison exhibit will be found in our advertising columns. Some of the material to be used at the lectures arrived from Edison's laboratory this morning.

NEW ENGLAND HOME JOURNAL Worcester Mass. April 26, 1884. THE ELECTRICAL EXHIBITION

In another part of this paper illustration is given of a most interesting feature of news. Beyond all question electricity and its applications offer the most scientific and industrial problems of the age. The future in electricity no man can fully grasp, but it seems certain that the revelation of wonders has but begun. The Worcester Natural History Society, under the lead of President Raymenton. has devised a project for bringing before the people of Worcester this whole subject of the new advance of electricity. The Mechanics Association management are strongly co-operating in the movement, and as the result the forth-coming evening at Mechanics Hall early in May, will give to a Worcester audience a better and more complete illustration and exhibition of the wonders of electrical progress than has ever yet been realized in any city in the United States.

In fact on that occasion or occasions will be practically illustrated what electricity has done and is doing.

So much interest has been excited in the proposition and plan, that the presence and aid of Thomas A. Edison has been secured, and as he is the by far the largest and most prolific inventor in the field, his presence will assure the adequate presentment of the material results he has accomplished. The event is one to which our citizens will look forward with much interest. On another page we illustrate somewhat fully the features of the Edison light and its sources and mechanism. There will also be present on the forthcoming occasion some of the leading electricians and expounders of electric progress, and the whole affair will be made vivid with electric facts and illustrations.

and the state of t

(Editorial.)

NEW ENGLAND HOME JOURNAL. Worcester Mass. April 26, 1884.

EDISON IN WORCESTER.

It is being received with very general satisfaction, the announcement of the preparations for a competent illustration before the public of this city, of the modern wonders of electricity in its application to the practical affairs of life. By the co-operation on this subject brought about between the Worcester Mechanics Association and the Worcester Natural History Society, will be given at Mechanics Hall, on May 1st and 2nd, a vividly interesting entertainment, for which the programme is now being prepared.

One feature of the forthcoming occasion is indicated in our caption, for the event in question is to bring to Worcester, Thomas A. Edison, to oc-operate with the management on the occasion, and make, what it will prove to be, the fullest and most remarkable illustration of the applied powers of electricity ever presented in New England. It will not only exhibit the use of electricity in illumination, but its general application to dynamics, and utilitarian purposes.

Not long ago we made some reference to the electric light as introduced in Worcester streets. The electric light as at present known is of two kinds, the incandescent and the arc. The latter is the one now becoming familiar on our streets. To any one who studies its simple mechanism it shows the two pencils of carbon, lightly coated with conper. for the sake of better conduction. Across the space between these in the lamp. the strong current of electricity leaps with the brilliant flash of light made permanent be-or Edison light, the process is something entirely different, for there is no break in the circuit, or rather, it is only broken by the continuous filament of carbon which makes the vivid horseshoe of light in this lamp. This will be seen in the illustration given herewith in the cut of the Edison lamp. It is a pear shaped globe of glass made a vacuum by exhaustion of air, within which the electric fluid is sent through the carbon filament, whose shape is shown.

\*\*\*\*\*\*\*\*\*\*\*\*

Were the same current to pass the filament in open air, it would be destroyed in a flash, but in the vacuum it glows a brilliant white with scarcely perceptible heat, and without combustion. One of these little filaments will give light for 1200 hours. The light itself is like sunlight as compared with the white intense glow of the incandescent light

which is of the type of moonlight.

The power of the Edison light ranges from 100 candle power to the tiny beacon of a small fraction of a candlepower employed in medical science and in a multiplying variety of curious applications, including the wonderful electrical jewelry, the filament being of the same character in all, though differing in size.

This filement found by Mr. Edison after long search among vegetable fibres, is from the bamboo, a splint of which is shaved and worked down until scarcely larger than a stout thread. This is reduced to carbon in a furnace of intense heat and furnishes what has thus far proved the only available wick for Edison's lamp, if wick it may be called.

The source of the electric current is the same in principle in all the systems, and at present constitutes the chief expense of electric lighting, the steam driven dynamo machines involving the principal outlay. These dynamos are of various patterns, and that of Edison we show elsewhere. The upright columns are the arms of a large magnet between which revolve the armstures.

Without attempting a full description of the process of electric lighting after the Edison type, let us say something of the man himself. He has suffered somewhat from the efforts of the sensational press to announce what he has done, and readers of half forgotten columns of high spiced news regarding Edison, may perhaps have gained the idea that his fame was discounted in a great expectancy only half realized.

The great public is most exacting with all its favorites and keeps only short credit accounts. Fulfilment must follow hard on the heels of promise.

The pilgrims in search of electrical wonders whose mecca a few seasons ago was Menlo Park, a station on the Pennsylvania railroad eighteen miles from New York. may as well be told that what was in this not very recent past a nursery garden of electrical ideas, has literally given developed plants to several great establishments in New York and New Jersey, the contributory departments of the Edison system, the parent corporation being the Edison Electric Light Company.

The Edison Electric Illuminating Company of New York is the city company which has for twenty months supplied a down town district containing over 12,000 lamps soon to be increased to 15,000 and comprised in the tract generally to be described as between the City Hall, Park and Wall street. These lamps are all supplied from the electric light station

on Pearl St. near Fulton St.

The Edison lamps are made at East Newark in a manufactory capable of turning out 50,000 lamps daily.

The Edison dynamo machines are made in the great manufac-

turing premises on Goerck street formerly occupied by John Roach. The Edison tube works are on Washington street. where are made the strong iron tubes carrying the cable conductors of the supply system. On 17th street at Avenue B. are the extensive premises of Bergmann & Co. where are manufactured the multiplicity of small and large metal mechanisms and appliances for electric purposes, for lighting and the telephone. There are great floors filled with costly machinery and warerooms brilliant with finished product.

The floor given to the illustration of the electric light is one of the marvels of New York, a perfect hall of wonders. Throughout all these great establishments runs the genius of Edison. On every side are his appliances.

He seems to be the Man of Ross in electricity, and his inventions far from dving out in the forgetfulness of news items have taken practical form and live in the industry of a thousand or more men.

The fact is the Edison fulfilment has far outrun the Edison promise. Unlike too many of the sons of genius who have suffered and perished from hope deferred, the practical development of the Edison inventions has kept even pace with their discovery, and the visit of Mr. Edison to Worcester as one of the principal events now in preparation, will bring

to the knowledge of our citizens a very thorough review of the progress of electric science and the places in practical life into which it is rapidly arriving.

EVENING GAZETTE Worcester, Mass. Monday Evening, April 28, 1884.

A DYNAMO

A Description of the Machine.

In view of the local interest in electrical matters, the following description of a dynamo, written for the Gazette by an expert electrical engineer, is of instructive

"What is the dynamo?" Within the last few days several very framk people have asked the question and have been very tersely answered by equally out-spoken friends with a brief "Blest if I know." Well, there is very little mystery about it. Properly it should be called the dynamo electrical machine and it is nothing more or less than a mechanical generator of electricity, as the battery is a chemical one.

With the dynamo coal is consumed, and through the inter-

vention of the boiler and engine, is converted into a current, while with the battery it (current) is the result of burning zinc up with sulphuric acid. In either case electricity results, but where it is required in considerable quantity, the chemical method costs somewhere in the neighborhood of twenty times as much as the dynamic.

Having established a boiler and engine, to create an electric light plant, the next step is to locate a dynamo. or generator, lead a belt from the wheel of the engine to that of the dynamo; then run the wires from the dynamo through the premises to be lighted, and connect the lamps.

This having been done it only remains to start the engine, and the dynamo begins to pump electricity through the wires and lamps. This goes on as long as the generator runs. Of course a water-wheel, gas engine or Keeley motor, can be substituted for the steam engine and as a matter of fact many electric light plants are to-day driven by turbine wheels, though no startling successes are vet credited to the two last named motors.

In the abstract the dynamo machine is a cylindrical magnet wound backward and forward, from end to end with wire.

The whole makes a drum which is placed on bearings, at . either end, and provided at one with a wheel which receives

the power from the engine. On either side of this drum, and partially encircling it, is an electro-magnet of great power. The combined arrangement suggests a small O between the arms of an inverted capital U. Now, let it be explained, after a dynamo is once started it always remains slightly magnetized. At any subsequent starting the machine rapidly charges itself and, in a few seconds, is working at its full efficiency.

The operation is this: The small residual charge in the field magnets- the legs of the U- act on the drum, or armature, magnetizing that and setting up a current of electricity in the wires wrapped around it. At the end of the drum opposite that to which the driving pulley is attached, is a copper cylinder called a commutator, on which rest two metallic, stationary brushes. These serve to sweep the current off as fast as it is generated in the armature, and, by means of leading wires, part is conveyed to the lamps, and part flows through the stationary magnets, keeping them in a complete state of magnetic saturation. By this principle of "mutual accumulation," as it is called, each part of the machine acts in turn upon the other and the result is the current which feeds the lamps. Such, in brief is the dynamo, and the principles herein stated are common to all machines.

Ohm.

MECHANICS HALL.

A Brilliantly Illustrated Lecture

on

ELECTRICITY!

And its Modern Practical Applications, will be

given at Mechanics Hall,

ON THURSDAY AND FRIDAY EVENINGS,

May 1 and 2, 1884, at 7.45 o'clock.

Under the auspices of the Worcester County Mechanics Association and the Worcester Natural History Society, favored by the presence and supervision of

THOS: A. EDISON.

The Great Facts of the Electric Light, both

ARC AND INCANDESCENT.

Will be shown and demonstrated by the most competent Electricians of the age, in a Programme of wonderful richness and variety.

Ex-Mayor S. E. Hildreth, President of the Worcester County Mechanics Association, and Dr. W. H. Raymenton, President of the Worcester Natural History Society, will preside. The opening feature of the evening will be the address of

SHERBURN B. EATON

Of New York, President of the Edison system of Incandescent Electric Lighting, on "The Modern Advance of Electric Science in its Useful Applications." Followed by the demonstration of interesting experiments by the eminent Electrician

PROF. E. H. JOHNSON

Of New York City, widely known as a popular lecturer throughout this country and Europe; who was in charge of the great International Electrical Exhibition at the Crystal Palace in

London.

The PLATFORM and HALL will be decorated for the occasion by Messrs. Luther Steringer and H. F. A. Lange, Floriat of Worcester, who will introduce many beautiful effects with the Edison Incandescent Light, such as the Illuminated Cardon with Poliage and Flowering Plants, and the Illuminated Aquarum of Gold and Silver Fish; all of indescribable brilliancy

and beauty wreals of Electrical Transmission will be illustrated by the MOTOPHONE, Loud-speaking or Chalk Telephons, the the course of the evening PROF. JOHNSON will introduce

#### PHONOGRAPH.

Which will repeat with marvellous accuracy Vocal, Elocutionary and Instrumental Effects so as to be heard in all parts of the hall.

the hall.

HERMCTRIC MOTOR will be shown and illustrated in its spullcation to Manufacturing and Domestic purposes, the Turning Lathe, Swing Machine etc.

In a Mechanical and Electrical Features of these lectures will have been supported by the second of the second se

# Students' Tickets.

Students of the several Educational Institutions in the presented with Free floats IX, and of the High School will be presented with Free floats and reserved seat for Friday night's ten hours of two and 'only respective school rooms between the hours of two and 'only respective school rooms between Superintendent of Schools. M. Friday, or at the office of the floats for Friday night can be purchased at the box-office Machanics Hall, Wednesday afternoon and evening, and at Putham, Davis & Co's on and after Thursday.

It is believed that the rare privilege afforded our citizens of seeing Edison, the greatest inventor of modern times, among the creations of his genius, will constitute one of the most marked and longest to be remembered features

of this occasion.
The Hall will be open at 7 o'clock; lecture will commence at 7.45.

#### EVENING GAZETTE

Worcester, Mass.

Thursday Evening, May 1, 1884.

EDISON'S ELECTRICAL EXHIBIT.

Preparations to Illustrate the Lectures on Electricity.

The preparations for the exhibition of a great variety of electrical appliances in Mechanics Hall this and to-morrow evenings, under the auspices of the Mechanics' Association and the Natural History Society, are making rapid progress to-day, and promise the most instructive exhibition on this subject ever made.

The preparations include the placing in the basement of Mechanics Hall building of a horizontal engine from the manufactory of A. Burlingeme of this city. The engine isbuilt from entirely new patterns, handsome and symmetrical in design, combining great strength in all the parts where

it is needed. It has large bearings and both sides of the centre, balanced cranks do away with the one side strain and give a direct line of work and a very steady motion, which is especially desirable in electrical work. The managers of this exhibition consider themselves fortunate in being able to secure, right here in Worcester, such an engine. It has a speed of 320 revolutions per minute and is to be run during the exhibition under the personal direction of Mr. Burlingame.

Some further description of this engine may not be out

of place at this time. Oil is supplied to all its parts by sutomatic feed cups, so arranged that the oil can be renewed without stopping the engine, allowing continuous runs of any desired length of time. All the materials used in construction are of the highest standard, and perfection is aimed at in every particular. These engines are adapted to either a high or low speed, as may be required for the work they are to do. Engines of this pattern are already in use in several places giving entire satisfaction. The large printing establishment of Messrs. E. C. Stone & Co. is supplied with one of 25 Horse-power, which does its work very satisfactorily, with a saving in fuel over its predecessor, doing the same work. The new Gazette perfecting press is

run by one of these engines, and Mr. Bertell's sausage factory on Church Street is supplied by power with one of 15-horse-power. Mr. Burlingame is also making for heavy manufacturing his improved Corliss valved engine, which takes high rank; a new one of this pattern is now building for Albert Curtis of New Worcester. Mr. Burlingame's business has been constantly on the increase, and one year ago he found it necessary to move into his present location, No. 15 Cypress St., where the increased facilities have been taxed to their utmost ever since.

The large Edison Dynamo of the Worcester Corset Co., a 200-light machine, has been moved to the basement of the hall and connected with the above described engine, and this in turn has been connected with a switch board on the stage by which all the various lights can be controlled.

On the stage are a great variety of electrical fixtures, consisting in part of two set pieces of 21 lights each, several chandeliers, some floral pieces which combine incandescent lamps with natural flowers; brackets, portable lights and particularly a large floral lattice in brass with colored lamps. This lattice is a part of the exhibit at the great electrical exposition in Crystal Palace, London, and is shown here for the first time in this country. Every leaf and flower is in harmered brass and is an exact repre-

sentation of nature. On the stage also are the loud speaking telephone, the phonograph, automatic and hand regulators for controlling electric lamps; a sewing machine and turning lathe with electric motors attached; an arc light which will be controlled from the stage; an old gas chandelier from the Worcester City Hall, converted in about three hours time into an electrolier, showing how quickly old gas fixtures can be utilized for electric lighting. There are also specimens of the underground tubing and joints, a pyramid of flowers from Mr. Hermann F. A. Lange, interspersed with colored Edison Lamps.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

These exhibits will be explained by Mr. E. H. Johnson of New York, MR. Luther B. Steringer, and a corps of the Edison Company's workmen. Major S. E. Eaton, President of the Edison Electric Light Company, will also address the audience, confining himself to the commercial aspect of the exhibit.

Mr. Edison and Major Eaton will arrive from New York at 5 o'clock this evening.

Yesterday after the close of the State Convention while the Edison workmen were waiting for the stage, the 10th District Convention, for which the west ante-room had been engaged, took possession of the stage and held it during the greater part of the afternoon, thus compelling the Edison people to work all night to get ready for to-night. EVENING GAZETTE.

Worcester, Mass.

Friday Evening, May 2, 1884. EDISON'S ELECTRICAL EXHIBIT.

Address by Major Eaton, and Explanations by Mr. Johnson.

The Edison electrical exhibition, in Mechanics Hall, last evening, opened successfully with an audience completely filling the Hall. President W. H. Raymenton of the Natural History Society and President S. E. Hildreth of the Mechanics' Association shared the duties of presiding.

Hon. Samuel E. Hildreth called the meeting to order and said that the gentlemen having the arrangements of the exhibition had selected the material for a thorough exposition of the subject of electricity. The great success of their efforts were in a measure due to the efforts of Dr. Raymenton. One of the influences which had led to the success was the securing the presence of the world renowned inventor, Thomas A. Edison. He had come on the sole condition that he should not be asked to speak from the platform. Mr. Edison, who occupied a seat beside the President, was received with hearty applause and smiled and bowed his acknowledgements.

13/1

proceeded to discuss the subject of electric lighting from a commercial standpoint. First he spoke of the great amount of capital invested in artificial lighting. In London over \$60,000,000 is invested in gas; over \$40,000,000 in Paris; \$20,000,000 in the United States. In developing the system of incandescent lighting, Mr. Edison begins, with the coal, and ends where gas does, in the single light or chandelier. The speaker pointed out the various steps through which the coal is converted into gas and conducted into houses for lighting purposes, and then described Mr. Edison's system of incandescent lighting. The slowness with which his invention has come into use has been owing to the conservatism of the company which has had charge of this part of the enterprise. They ascertained that the business could be done at a profit in a city by extensive plant with the wires underground. It was next demonstrated that it could also be done in a scattered village by a plant at a New Jersey town of 80 houses when the wires are strung upon poles, instead of underground.

Major S. B. Eaton of New York was then introduced and

《7年节录》:""以养法养养养养养养养养养,产以产以养养

Among the advantages are cleanliness, and the fact that the light can be thrown just where it is needed. It is better for the eyes than gas, because its rays are nearly like those of daylight. He described the business of furnishing light to consumers and measuring the current for power or light over metres adopted from a natural principle, and which are perfect in their work. The subject of incandescent lighting is all due the inventive genius and the shrewd business sense of Thos. A. Edison. His remarks were received with applause.

Dr. Raymenton then in a few words of explanation, introduced Mr. E. H. Johnson, who proceeded to explain the
electric light from its discovery by Sir Humphrey Davy down
to the present time. The first light was the arc light,
similar to that now used in the Thompson-Houston system.
These lamps have kept pace with the development of the dynamo, first invented by Faraday. The arc light now in use
in Worcester, was explained, and one hanging in the wall was
lighted.

He next entered upon the merits of Mr. Edison's inventions. He called attention to the great variety of uses to which electricity is put, the vast number of telegraphic lines to transmit messages, to sound burglar alarms, to call messenger boys and policemen, etc. This light is produced by heating to a white heat a loop of carbon in a globe from which the air has been exhausted to one millionth of an atmosphere.

He then explained at some length the development of the system, showing the underground tubes in which the wires are enclosed for the conveyance of the electric current to the houses where light or power is wanted. A lamp was broken to show that it would cause no damage. When broken the lamp was enclosed in Mr. Johnson's handkerohief, which was not in the slightest degree injured. He described the chandeliers and electroliers showing that costly gas fixtures can be utilized for the system of incandescent lighting. He showed the effect of overloading a wire with the electric current, and showed how absolute safety could be secured from danger from this source by a safety-plug, which will burn off and break the circuit before any damage will result to the wire.

Of the power of the light he said 16 candle-power was selected as the unit of light because that has been found to be the amount best adapted to the eye. Where more light is needed, to light large spaces or for decorative purposes, multiples of this candle-power are used. Lamps were shown of 16, 32, 64 and 100 candle-nown.

The hand and automatic regulators by which the current of electricity in a factory or other large establishment can be controlled, were then explained, and their practical working demonstrated by the lamps on the stage.

The electrical meter, one of the most interesting and

delicate of all Mr. Edison's inventions, was fully explained. It consists of two plates of metal suspended in a solution, through which the electric current is passed, causing particles of metal to leave one plate and attach themselves to the other; and the amount of electricity that has
passed over the wire is ascertained by weighing the plates
and by mathematical calculations based on the loss of one
and the gain of the other.

The Phonograph was then exhibited and its performances were received with hearty applause. The phonograph exhibited last night repeated conversation, two verses of "Mary had a little lamb," laughed, coughed, whistled, sang, and repeated a cornet solo. It was easily heard in all parts of the hall.

The speaking telephone was next shown. It differs from the ordinary telephone in the construction of the receiver, which has a diaphragm similar to that in the phonograph made of mica, and the vibrations are made audible by means of a chalk cylinder rotated by a crank. Its performances consisted of singing, speaking, whistling and a cornet solo. The electric motors did not work, because the time for preparation had been too short to properly connect and test them. But doubtless they will be in working order this evening, when all the interesting features of last night's

exhibition will be repeated.

After the lecture some 30 gentlemen were invited to meet Mr. Edison at the Bay State House, where an informal lunch was served, and an hour spent in social chat. Mr. Edison was the centre of an interested group at all times, and is evidently fond of explaining his inventions to appreciative listeners, though no conversationalist on general topics.

Speaking of the phonograph he said that he felt confident he could make it a commercial success if he could devote two years' study in perfecting it.

The guests present at the table headed by Mayor Reed were:

Thos. A. Edison of New York, ex-Mayor Saml. E. Hildreth, Dr. W. H. Raymenton, Major S. B.

Baton of N. Y., E. H. Johnson of N. Y., Spencer Borden of Fall River, Hon. T. C. Bates, Stephen Sallebury, Jr., Frank P. Upton, ex-Mayor E. B. Stoddard, Dr. Homer T. Fuller, Samuel S. Green, A. P. Marble, J. Evarts Greene, Milton P. Higgins, Mayor Chas. G. Reed, Samuel Winslow, P. W. Moen, Hon. Edw. L. Davis, Mr. Heywood, Henry A. Mareh, T. M. Rogers, Dr. Merrick Bemis, Henry M. Smith, Chas. E. Whiting, Geo. D. Bancroft, J. P. Munroe, Geo. Stummer, E. O. Parker, W. A. Smith, Luther Steringer, of New York, Geo. Stearns, Maj. L. G. White, John M. Bemis, C. D. Stickney of Fall River, Wm. E. Allen.

## EVENING GAZETTE.

Friday Evening, May 2, 1884.

A Tour of the Factories and Other Institutions.

It was in accordance with the plan of the reception to Mr. Edison and his friends in Worcester, that they should visit some of the principal manufactories and educational institutions here, and this part of the programme was carried out to-day.

At 10 o'clock the reception committee assembled at the Bay State House, and an hour afterwards escorted their guests to carriages in waiting. The party included the following gentlemen: Messrs. Edison, Tomlinson, Steringer, Upton, Johnson, Russell and Hodginson of New York, Borden and Stickney of Fall River, and Mayor Reed, President Parker of the Common Council, ex-Mayor Hildreth, Supt. A. P. Marble, Dr. M. Bemis, Dr. Raymenton, Wm. Allen, Stephen Salisbury, Jr., Hon. T. C. Bates, Nathaniel Paine, Geo. D. Bancroft, and H. M. Smith of this city.

The first place visited was the Washburn & Moen manufactory on Grove St.

Entering the office the visitors were courteously re-

ceived by Mr. Charles F. Washburn, who immediately escorted them through the mill, covering nearly every department.

The first stop was made at the rolling mill, and both the old and new processes of drawing wire were inspected.

Much interest was manifested in the new or Belgian process, which is an important improvement over the old methods.

In this department the red hot rod is first taken from the furnace and is then drawn only once through continuous rollers, without having to return back and forth as by the old way. The rapidity of the drawing process and the perfect management of the heated wire by the workmen while transferring it from one roller to another was a fact pleasurably commented upon by Mr. Edison. The other departments visited was the barbed wire rooms, and it was explained that 80 miles of barbed wire per day was the average rate of manufacture. In the storage room there were piles of spools with barbed wire of various sizes, each spool containing 100 pounds, equal to 100 rods of barbed wire.

Passing from this department the party entered tempering rooms, and afterwards inspected the galvanizing and annealing departments. The passage through the factory was hasty, by reason of the short time permitted, but all the most important processes received attention.

Leaving the wire mill, the party were next driven to Messrs. S. R. Heywood & Co's boot and shoe manufactory on Winter Street and there crossed the street to Mr. J. H. and G. M. Walker's establishment. In the Heywood factory they were received by Mr. Heywood, who conducted them through all the rooms., Their attention was directed particularly to the Goodyear machine, a new and improved patent, in the bottoming department. The machine is in two parts, and sews both welt and out-sole, doing it as well, it is claimed, as by hand sewing, and turns out 150 pairs of boots or shoes per day. At Messrs. Walker's factory the greatest interest was manifested in the improved pegging machines, but all the rooms were visited, and the majority of the other processes inspected.

Leaving the Walker factory the gentlemen returned to the carriage and were driven to the Museum of Natural History on Foster St., where half an hour was pleasantly spent in examining specimens. The next institution visited was the Public Library, and there Mr. Edison seemed to take much interest in the surroundings. Theparty afterwards visited the Antiquarian Hall, Mr. E. W. Vaill's factory, the Normal School, Worcester Free Institute and the High School, following which they returned to the Bay State House.

THE DAILY TIMES.
Friday May 2, 1884.
EDISON'S EXHIBITION

The Electric Machine, The Phonograph and the Telephone.

"The Wizard of Menlo Park," Thomas A. Edison, afforded the citizens of this city a rich treat last at Mechanics Hall, by an explanation and exhibition of his many inventions. The stage presented a beautiful appearance with the many colored lights and arrangement of Mr. Edison's wonderful inventions. There were electric lights in all sorts of arrangement and color; in chandeliers, singly, in masses of flowers, in an aquarium among lively fishes, in hand lamps and swinging lamps, and other devices for general convenience. Prior to the lecture, Mr. Edison was visited in the ante-room by leading citizens, and after the lecture he was entertained at the Bay State House by a large party of gentlemen. The Hon. Samuel E. Hildreth and Dr. W. H. Raymenton, President of the Natural History Society, escorted Mr. Edison to the platform at 8 o'clock and introduced him to the audience, who applauded him very generously. Mr. Hildreth explained the purpose the societies had in view in bringing Mr. Edison; he said thanks were due to Hon. T. C. Bates, for the use of his dynamo, and

to Mr. Anson Burlingame of Cypress St. at whose shop the dynamo was being run to furnish a current for the experiments. Mr. Hildreth then introduced the lecturer.

Major Eaton of New York, spoke at length on the Edison system of lighting. He said an evening with Mr. Edison's inventions would be incomplete without the system of incandescent lighting. What is the Edison system, its history and its success? Mr. Edison in inventing his system has undertaken to complete a better system than formerly existed. He begins where gas does at the coal pile, and ends where it does in the light. Ocal is used to create steam, which is carried to the engine, this in turn connected with the dynamo, from which the current passes as gas does, by mains to the houses, a meter being used as in gas.

Five years ago a body of scientists in London testified before a parliamentary committee that incandescent lighting was impossible. At the time Mr. Edison thought he had solved the problem, but he further experimented three years before giving it to the world. What is shown here now is no longer merely an exhibition. But he was restrained at first by the conservation of business men, who feared to start in competition with 300 millions put into gas. They began at length in New York, and for a year and a half worked for its introduction, and it has now been used for

20 months. Proved successful in a large city, it was tried in a small town with but 80 houses. Here the wires were put overhead, those in New York being underground, and here, too. the plan was successful. Now 13 companies have been started all engaged in the same business as the New York company-that of forming an electric current and selling it to consumers over a wire. The superiority over gas consists in its cleanliness; it does not vitiate the air nor injure paintings nor gilding. It is better adapted to the human eye, having much the same rays as daylight. The light is also adapted for use in specific places. The meter can be relied upon for accuracy, being founded on a law of nature, and not on a device of man. The current can also be used for power from small machines to large industries. Mr. Edison ran his establishment at Menlo Park for some time with electricity. Another Edison industry is isolated lighting, which bears the same relation to general companies that one lamp does to the city plant.

There are now 310 of these isolated plants with some 60,000 lamps. In New York there are 509 consumers m with some 11,000 lamps. The current is regulated by the number of engines at work in the central station. Dr. Raymenton then introduced Mr. E. H. Johnson of New York, the confidential assistant of Mr. Edison. He said that his 14 years of association with Mr. Edison has shown him the latter liked of all

not to be talked about, so he would confine his attention entirely to what the inventor had done. The electric light was briefly sketched. It began with Sir Humphrey Davy, but languished for the lack of strong current until Faraday · invented the dynamo machine. The arc light has kept pace with the improvement of this machine. It is practically two pencils of carbon, held slightly separated by mechanical means. The principal is that a current passing through jumps the separating interval, carrying particles of carbon with it and forming a voltaic incandescent arc. The production of a small light for household use was the problem Mr. Edison solved. The speaker turned aside to enumerate the uses of electricity, noting especially the increase in its use as a domestic agent, and pointing the convenience of having a current brought to the house and measured out rather then having a battery, which would be a source of trouble in the house.

A centre piece of gilt filagree at the back of the stage was here lighted up by a number of incandescent lights, with colored globes hung before it. The light was explained as a filament of carbon heated to incandescence in a vacuum. The pipes, with their copper wire, and the conductors were shown and explained, and the convenience in lighting and turning off shown. It was shown how a light could be

next a steamship lantern, with wires to allow of using in small confined places. The lamps will all wear out by the separation of the carbon. This requires from 1000 to 2000 hours. A night lamp with two burners arranged in an electric magnet. with an armature, was shown, that would burn continually, one igniting the other if itself worn out. The lecturer showed the freedom from danger by accident to the lamp by binding his handkerchief over one and then breaking the glass. Lamps in the middle of cut flowers were lighted to show the absence of heat. Two chandeliers of 20 lights were also lighted, a portion at a time, to show the convenience of handling. The lecturer explained how arrangements of the current could be made so that burglars effecting an entrance would light the whole house. An electrolier, a combination of gas and electric light chandeliers was exhibited, and the possibility of transforming the ordinary gas chandelier into an electric light chandelier shown. The lecturer next showed the danger of the science by currents too strong for a wire, by the experiment of burning a wire. The preventive of accident by the lead safety plug was also explained. Lamps of 16, 32, 50, and 100 candle power were then exhibited, and the means of controlling the current both by hand and automatic regulators.

turned down by forming a bridge to the current by two lamps:

turned to the meter which records the amount of electricity consumed. It consists of two plates of metal in a bottle solution, the current causing an interchange of metal and consequence change in weight. This change of weight gives a means of measurement of the current. The various applications of the current as a motor could not be illustrated because of lack of time to make preparations. lamp and cigar lighter were lastly exhibited. graph was the next invention to be described. Its principle is tracing on a barrel of tin foil by a needle point itself attached to a diaphram. The vibrations of a human voice are graphically represented by the indentations of the needle. The foil is wound on a cylinder, which is kept in motion. Reversing its motion causes the needle to retrace its course and return the vibrations to the diaphram, which in turn transmits them to the air.

Having thus run over the light in various forms, he

The exhibitor then gave exhibitions of the instrument in talking, laughing, whistling, singing and playing on the cornet. The telephone followed. Mr. Edison's contribution to the general system being the carbon transmitter.

His own peculiar system, however, is the speaking telephone, which is used to a certain extent in England, but not much in America. Its working resembles that of the

phonograph in that a motion of a cylinder is required.

The cylinder is of chalk, the current carrying the vibrations of the voice working upon it, and tending to overcome the friction of the cylinder against the diaphram of the receiver. The exhibitor talked with an assistant stationed in the basement the latter's voice being distinctly heard all over the hall, as was also the cornet played in the basement. This concluded the exhibition. To-night, in its repetition it is intended to have the arrangement of the stage entirely changed, and all the motors, etc., for which time for arrangement was lacking, in complete working order. To-day the visiting electricians are guests of the committee who will take them on a tour of observation about the city. They will visit the Free Institute, various shops and points of interest

WORCESTER DAILY SPY.
Friday, May 2, 1884.
THE KLECTRICAL EXHIBITION.

Edison's Inventions -- The Electric Light, The Phonograph and the Telephone.

Mechanics Hall was filled to its utmost capacity last evening, on the occasion of the grand electrical exhibition, and the audience for two hours was treated to explanation and illustration of the devices created by the wizard of Menlo Park. The stage was filled with his various inventions -- electric lights in all sorts of arrangement and color; in chandeliers, singly, in masses of flowers, in an aquarium among lively fishes, in hand lamps and swinging lamps, and other devices for general convenience. The inventor himself, Mr. Thos. A. Edison, received an impromptu reception in the ante-room, and then appeared upon the stage shortly before 8 o'clock, escorted by Hon. Samuel E. Hildreth and Dr. W. H. Raymenton. His appearance was a signal for prolonged applause. Mr. Hildreth in a brief speech explained the motive of securing the attendance of the noted electrician, and said much of the credit was due to the indefatigable president of the Natural History Society.

Thanks were also due to Hon. T. C. Bates for the use of his dynamo, and to Mr. Abraham Burlingame, at whose shop on Cypress St., the dynamo was being run to furnish a current for the experiments. He then introduced Major Eaton of New York, who spoke at length on the Edison system of lighting.

What is the Edison system, its history and its success?
Mr. Edison in inventing his system has undertaken to complete
a better system than formerly existed. He begins where gas
does at the coal pile, and ends where it does in the light.

Coal is used to create steam, which is carried to the engine, this in turn connected with the dynamo, from which the current passes as gas does, by mains, to the houses, a meter being used as in gas. Five years ago a body of scientists in London testified before a parliamentary committee that incandescent lighting was impossible. At that time Mr. Edison thought he had solved the problem, but he further experimented three years before giving it to the world.

What is shown here now is no longer merely an exhibition. But he was restrained at first by the conservatism of business men, who feared to start in competition with 300 millions put into gas. They began at length in New York, and for a year and a half worked for its introduction, and it has now been used for 20 months. Proved successful in a large city, it was tried in a small town with but 80 houses. Here the wires

were put overhead, those in New York being underground, and here, too, the plen was successful. Now 13 companies have been started, all engaged in the same business as the New York company—that of forming an electric current and selling it to consumers over a wire. The soperiority over gas consists in its cleanliness; it does not vitiate the air nor injure paintings or gilding. It is better adapted to the human eye, having much the same rays as daylight.

The light is also adapted for use in specific places. The meter can be relied upon for accuracy, being founded on a law of nature, and not on a device of man. The current can also be used for power for from small machines to large industries. Mr. Edison ran his establishment at Menlo Park for some time with electricity.

Another Edison industry is isolated lighting, which bears the same relation to general companies that one lamp does to the city plant. There are now 310 of these isolated plants with some 60,000 lamps. In New York there are 509 consumers, with some 11,000 lamps. The current is regulated by the number of engines at work in the central station. Dr. Raymenton then introduced Mr. E. H. Johnson of New York, the confidential assistant of Mr. Edison. He said that his 14 years of association with Mr. Edison had shown him the latter liked least of all to be talk-

ed about, so he would confine his attention entirely to what the inventor had done. The electric light was briefly sketched. It began with Sir Humphrey Davy, but languished for the lack of strong current until Faraday invented the dynamo machine. The arc light has kept pace with the improvement of this machine. It is practically two pencils of carbon, held slightly separated by mechanical means. The principle is that a current passing through jumps the separating interval, carrving particles of carbon with it and forming a voltaic incandescent arc. The production of a small light for household use was the problem Mr. Edison solved. The speaker turned aside to enumerate the uses of electricity, noting especially the increase in its use as a domestic agent, and pointing out the convenience of having a current brought to the house and measured out rather than having a battery, which would be a source of trouble in the house. A centre piece of gilt filagree at the back of the stage was here lighted up by a number of incandescent lights, with colored globes hung before it. The light was explained as a filament of carbon heated to incandescence in a vacuum. The pipes, with their copper wire, and the conductors were shown and explained, and the convenience in lighting and turning off shown. It was shown how a light could be turned down by forming a bridge to the current by two lamps; next a steamship lantern, with wires to allow of using in small

· 中華教養教育學 (1985年)

confined places. The lamps will all wear out by the separation of the carbon. This requires from 1000 to 2000 hours. A night lamp with two burners arranged in an electro magnet, with an armature, was shown, that would burn continually, one igniting the other if itself worn out.

The lecturer showed the freedom from danger by accident to the lamp by binding his handkerchief over one and then breaking the glass. Lamps in the middle of cut flowers were lighted to show the absence of heat. Two chandeliers of 20 lights were also lighted, a portion at a time, to show the convenience of handling. The lecturer explained how arrangements of the current could be made so that burglars effecting an entrance would light the whole house.

An electrolier, a combination of gas and electric light chandeliers, was exhibited, and the possibility of transforming the ordinary gas chandelier into an electric light chandelier shown. The lecturer next showed the danger of the science by currents too strong for a wire, by the experiment of burning a wire. The preventive of accident by the lead safety plug was also explained. Lamps of 16, 32, 50 and 100 candle-power were then exhibited, and the means of controlling the current both by hand and automatic regulators. Having thus run over the light in its va-

rious forms, he turned to the meter which records the amount of electricity consumed. It consists of two plates of metal in a bottle in solution, the current causing an interchange of metal and consequence change in weight.

This charge of weight gives a means of measurement of the current. The various applications of the current as a motor could not be illustrated because of lack of time to make preparations. The movable lamp and cigar lighter were lastly exhibited. The phonograph was the next invention to be described. Its principle is tracing on a barrel of tin foil by a needle point itself attached to a diaphram.

The vibrations of a human voice are graphically represented by the indentations of the needle. The foil is wound on a cylinder, which is kept in motion. Reversing its motion causes the needle to retrace its course and return the vibrations to the diaphram, which in turn transmits them to the air.

The exhibitor then gave exhibitions of the instrument in talking, laughing, whistling, singing and playing on the cornet. The telephone followed, Mr. Edison's contribution to the general system being the carbon transmitter.

His own peculiar system, however, is the speaking telephone, which is used to a certain extent in England, but not much in America. Its working resembles that of the phonograph in that a motion of a cylinder is required. The cylinder is of chalk, the current carrying the vibrations of the voice working upon it, and tending to overcome the friction of the cylinder against the diaphram of the receiver. The friction is overcome in waves of sound which the diaphram reproduces. The exhibitor talked with an assistant stationed in the basement, the latter's voice being distinctly heard all over the hall, as was also the cornet played in the basement. This concluded the exhibition.

To-night on its repetition it is intended to have the arrangement of the stage entirely changed, and all the motors, etc., for which time for arrangement was lacking, in complete working order. To-day the visiting electricians are guests of the committee, who will take them on a tour of observation about the city, with visits to the Free Institute, various shops and points of interest.

On the conclusion of the exercises at the hall last evening, Mr. Edison held another informal reception at the Bay State House. An excellent supper was served, some 50 gentlemen sitting down to the table. Each guest was presented with an Edison 16 candle incandescent lamp as a souvenir of the occasion. There were no speeches, the evening closing with informal conversation.

NEW ENGLAND HOME JOURNAL.
Worcester, Mass., May 3, 1884.
THE EDISON EXHIBITION.

Mechanics Hall was crowded to its utmost on Thursday evening, to witness the electrical exhibition of Mr. Edison's inventions. The stage was filled with various electrical devices. There were electric lights in all colors and all sorts of arrangements. Chandeliers were hidden among great piles of flowers, while various hand and swinging lamps were lighted in the course of the explanations. Mr. Edison was loudly applauded when under the escort of ex-Mayor Hildreth and Dr. W. H. Raymenton, he appeared upon the platform.

Mr. Hildreth after a brief speech explaining the origin of the movement to secure Mr. Edison, introduced Major Eaton of New York, who gave an account of the Edison system of lighting, its history, its development, and its success, which held closely the interest of the great audience.

Dr. Raymenton then introduced Mr. E. H. Johnson of New York who has long been Mr. Edison's confidential assistant. After a brief explanation of the History of electricity, and Mr Edison's contributions to the science, he proceeded to give various experiments of Mr. Edison's inventions. He showed

how the incandescent system of lighting (Mr. Edison's) can be used successfully for domestic purposes, after much the same manner as gas. Electric lights were placed among a pile of flowers to show that there was no heat nor noxious odors, the flowers remaining fresh and unharmed.

It was shown also how the danger from electric lights could be successfully averted, rendering them perfectly harmless, and the lecturer explained how electricity could be measured by meters with absolute accuracy.

The exhibition of the phonograph was loudly applauded by the audience, as it gave back the talking, singing, whistling and laughing tones of the speaker. The exhibition closed with explanation and exhibition of the Edison telephone.

At the conclusion of the exhibition, Mr. Edison held an informal reception at the Bay State House. Supper was served at which some 30 gentlemen sat down. Each gentlemen was presented with a 16 candle Edison lamp as a souvenir of the occasion. Under the escort of a local committee the party of Mr. Edison made a tour of principal points of interest in the city, including Antiquarian Hall and the Public Library.

WORCESTER DAILY SPY.
Saturday, May 3, 1884.
THE ELECTRICAL EXHIBITION.

An Illustration of Electricity and its Many Uses.

The exhibition of the incandescent electric light and the other inventions of Edison was successfully repeated in Mechanics Hall last evening, and several features omitted. Thursday were included in the display. As before, Hon. Samuel E. Hildreth presented Major S. B. Eaton of New York, the president of the Edison company, but the latter excused himself from extended remarks to give further time for the experiments. He, however, briefly sketched the history of the Edison light, and said the inventor possessed 300 patents on his inventions in the United States alone.

Mr. E. H. Johnson again explained the various devices of the great electrician. One incident which he related, afforded considerable amusement. When the announcement was publicly made that Mr. Edison had solved the problem of interior illumination by means of the incandescent system, the scientific journals and magazines were flooded with articles to prove it impossible.

These, Mr. Johnson said. it was the custom of Mr. Edison and his assistants to read by the light of the new incandescent light. The lecturer explained the manufacture of the light more at length. The carbon filament is a strip of bamboo six inches long, eight one thousandths of an inch wide. The chief additions to the entertainment were the electric motors in operation. The motor was described as a miniature dynamo driven by electricity instead of by some other external force and transmitting its motion to some machine. The first exhibition of one was in connection with a floral pyramid of flowers, prettily arranged by Mr. Hermann F. A. Lange which was made to revolve by a small motor. Electric lights were interspersed among the flowers. A sewing machine and a lathe were also run by motors, the latter by one rated at one fifth of a horsepower. It was stated that the cost of running a sewing machine continually for one day was one and one fourth cents presumably at the rates established under the New York plant.

To show the facility of change from gas to electric light fixtures, a gas chandelier taken from the city hall was shown lighted with Edison lamps, the changes it was stated having been made in a few hours. In connection with the light placed in the aquarium, it was stated that from

the United States fish commission ship Albatross, an Edison lamp had been sunk 1000 fathoms, and endured the pressure.

The arrangement of the underground conductors was also more fully explained. The three copper wires are inserted in an iron tube, and held apart by rubber washers slipped over them. Then the tube is filled with insulating material, which hardens, making a compact mass of the whole.

Other novelties were a miniature lamp of one candlepower for use by dentists in illuminating a patient's mouth, which was compared with a large light of 150 candle-power.

Two electric clocks, manufactured by J. P. Kettell of this city, were shown, one supposed to be the standard controlling the other, and regulating its movements each hour. There was a large audience present. Several hundred tickets were distributed among scholars in the High School, grade 9, the Free Institute and the Normal School.

After the hall was cleared several photographs of the stage were taken by W. H. Fitton under the electric lights.

EVENING GAZETTE.

Worcester, Mass.

Saturday Evening, May 3, 1884.

INCANDESCENT LIGHT.

The Second Edison Exhibition in Mechanics Hall.

The numbers present at Mechanics Hall, last evening, at the Edison electrical exhibition was nearly as large as the night before. All the details of the exhibition were in perfect order, and worked to a charm.

Ex-Mayor Hildreth, in calling the company to order, made reference to the more complete preparations, which were impossible the night before, as they could not have the hall in time. In closing he introduced Major S. B. Eaton of New York, President of the Edison Company.

He explained in some detail the Edison system and its commercial aspects, substantially as reported. He spoke very complimentary of the industries of the city, and expressed surprise that they were so varied.

Dr. Raymenton presented Mr. Edison and then introduced his confidential associate, Mr. E. H. Johnson, who explained the incandescent system of lighting at considerable length. He began with reference to the making of the steam, then referred to the power, and the dynamo where the electricity is generated. All this has been furnished the readers of the Gazette from time to time. Much of the lecture was the same as the first and reported yesterday. The appliances for light, heat and power were all in active operation at one time on the platform, and all furnished by one and the same current, which was under the direct control at all times of the speaker.

The new features of last night's exhibition were the electrical motor and the electric clock. An electric motor is a miniature dynamo, the working of which is the reverse of the dynamo, which generates the current at the central station. Then the current is generated by the dynamo and passes to the service wires by the brushes, not so with the motor; there the wire of the circuit carries the electricity to the brushes which bear on the commutator, and so a current of electricity flows through the wires, a part going through the armature and another part through the magnet and by the mutual separation between the field magnets and the armature, the current passing through produces the motion on the shaft and pulley connected with the dynamo, and the motion is carried to the machine by a small belt.

The floral pyramid, some six feet in diameter, was rearranged last night by Mr. Hermenn F. A. Lange.

Without the light it was a fine exhibit. This was made to revolve by a motor underneath the table. There were attached to the table six circuits of wires, each of which was opened and closed during one revolution.

The lamps were of various colors, and the effect of the changing of lights was beautiful. The sewing machine was next started; the lady operator who had not seen the attachments until she went upon the platform, was able to handle and control it with ease. Mr. Edison stated that the expense of operating the motor was one and a quarter cents per day. The turning lathe was started with a motor of one fifth of a horse power. The last new experiment was the clock regulator, the work of Mr. J. P. Kettell of this city. The clocks were placed on each side of the hall; one was set at standard time and as the minute hand arrives at the hour all the clocks connected with it are set to correspond. It is particularly designed for lines of railroad and large establishments. Mr. Kettell has on one line, which is working successfully, 28 clocks, on a stretch of wire 98 miles in length. After the exhibition Mr. W. H. Fitton photographed the stage as a whole, and also the several pieces exhibited. Messrs. Edison, Tomlinson, Upton and Russell left this city for New York on the

midnight train last night. The rest of the party will remain in Worcester until this evening.

WORCESTER DAILY SPY.
Supplement.
Wednesday, May 7, 1884.

EDISON IN WORCESTER.

Some Notes of the Recent Electrical Exhibition.

The Edison party left Worcester for New York by the midnight train on Friday after the second evening at Mechanics Hall. They expressed themselves greatly delighted with their reception and entertainment in this city, and at the success of the novel and charming exhibition in which they had borne part. Our citizens have the right to the solid satisfaction of knowing that no occasion of the kind ever took place in this or any other country where the modern advance of electric science in practical applications has been so fully and beautifully illustrated as at Mechanics Hall on the two evenings of last mask

Dr. W. H. Raymenton, President of the Worcester Natural History Society, stands responsible for the inception and the carrying out of the whole affair, and from him has been obtained some of the facts and incidents of the undertaking. His indefatigable efforts in this and other kindred objects have made his methods pretty well known to our citizens, so much so, indeed, that when it is understood that he has got his forces well at work, our public speedily look for the results sure to arrive. In the practical application of electricity or any other science to the affairs of life, the methods of reaching the public with the information they seek are hampered not a little by the fact that the subject has become a business matter, and somebody will be benefitted by the discussion. Especially is this true of the new adaptations of electricity. Who shall best tell of its progress if not those most interested in its advance? But this will be "advertising."

Dr. Raymenton looked these considerations squarely in the face, and then, as furnishing the best sources of the information he asked in behalf of his Natural History Society, he resolved to go at once to the fountains of such information. Some months ago he began the correspondence with leading authorities in the various fields of electric lighting and the electric motor, inviting them to unite in an entertainment of a purely scientific character, and edu-

cational in its purposes, leaving them to find their own subsequent advantage in the presentment. As the project grew, its very bulk and its broadening into the field of the mechanic arts caused the co-operation of the Worcester County Mechanics Association, and from that time the work went forward apace.

The inside working of such an undertaking is always entertaining. Dr. Raymenton gives a graphic account of the first visit of the Worcester party to Mr. Edison's office to enlist him in the project. He at first utterly refused. He was too busy to be butchered for anybody's holiday; never spoke in public; would not be made a show of. But when it was shown that two societies were co-operating in the matter and were pledged to their members for the character of the entertainment, Mr. Edison consented to come to Worcester, and from that time throughout was one of the most earnest and active of helpers for the success of the affair.

Now when it is understood that the recent electrical entertainment carries forward the policy of our Natural History Society as established and for several years pursued by its President, the explanation not only leaves nothing uncertain as to past entertainments, but it gives a promise for future undertakings in the announced direc-

tion of seeking the fullest and clearest information as to the application of scientific knowledge to the affairs of life. When the telephone was first introduced in Worcester, the manager of the local company gave a very able exposition of the new instrument, followed a few weeks later by an admirable illustrated lecture by Charles A. Chase, giving the public the information that was timely and desired. The horse lecture by John E. Russell is also in point.

That these all are but the beginning of what is to be, seems to be fully assured by the spirit of the two associations, whose achievement of last week created two of the most remarkable occasions ever given in Mechanics Hall.

Ex-Mayor Hildreth, President of the Mechanics Association, occoperated throughout the matter, was one of the first visiting party to New York, and was closely connected with the arrangements that brought this success.

Asking Dr. Raymenton what next the public may look for, his answer was; "During the past five years that I have been President of the Natural History Society it has been my aim to give the people of Worcester and our lecture audiences and classes the best and latest information of the day on any subject coming within the domain of natural science. Our work in our popular classes, lectures, field-

meetings, museum work, etc., has been, like that of our public library, unique and original, and we have covered a wide range of subjects. "What next?" "Well, we shall see." NEW ENGLAND HOME JOURNAL. Worcester, Mass., May 10, 1884. Curious, wasn't it? That while the great audience at Mechanics Hall on Friday evening were studying the electric light, that same light of the arc pattern was busying itself in setting fire to Louis Friendly's store. The loss was not large and we are waiting to hear some wise-acre declare it an "advertising dodge" of the incandescent people. The fact is that all points of caution must be observed or the electric light is a dangerous fire bug. The city took in its fill of electric lighting, in the two great occasions at Mechanics Hall, last week, whereby several thousand people young and old were easily helped to know more of Edison and his light than they could have learned in BIRD'S-EYE VIEW OF WORCESTER. any other way. A company is following hard upon the heels of the Edison entertainments, to reduce the problem to prac-

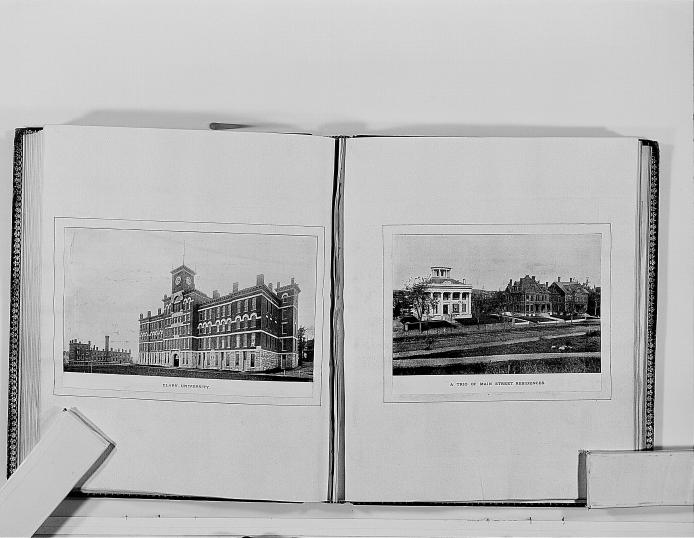
tice in the lighting of Worcester homes, and this will be a further benefit if oil and gas are superseded by the beauti-

ful illuminator.



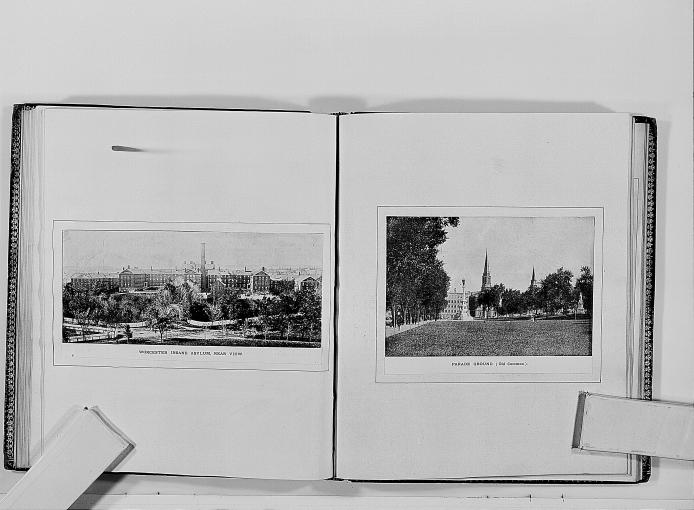
2.即查在各有的有不和各种在有效可能不会有一个不会有於

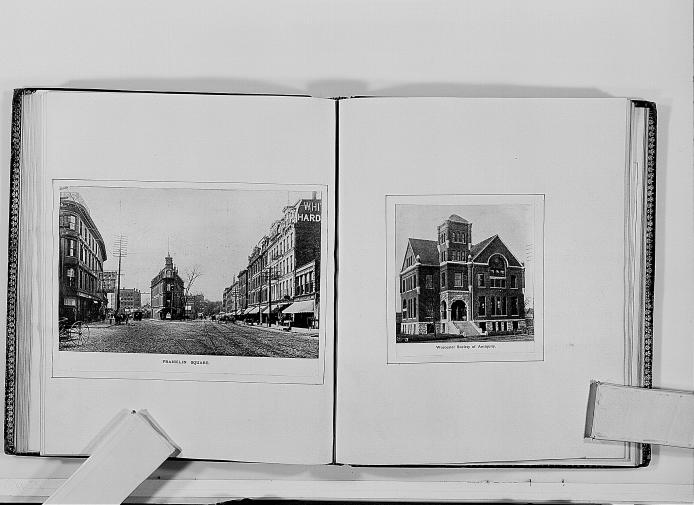


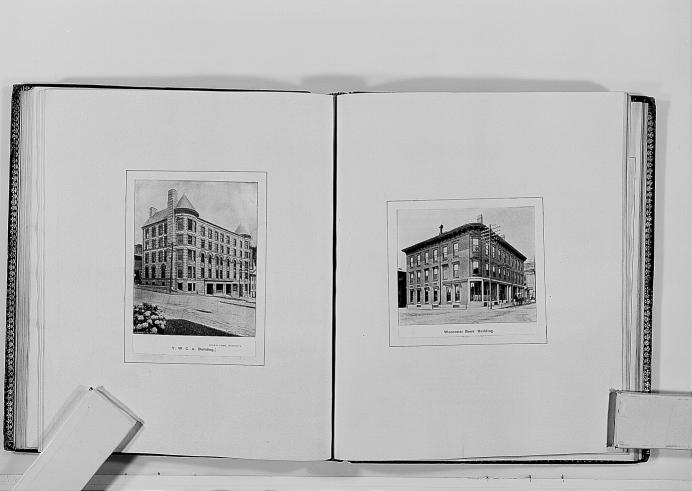


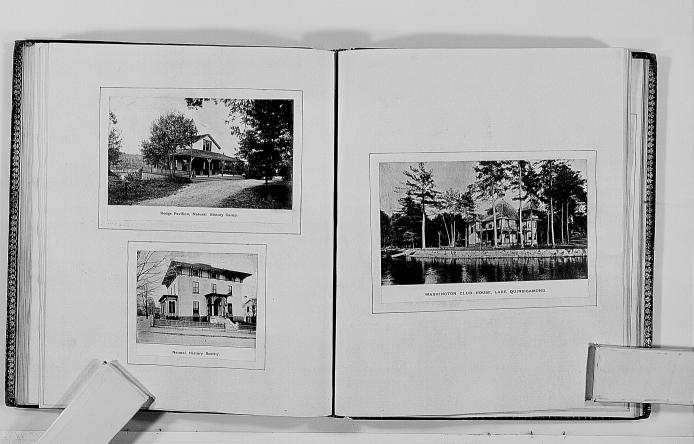


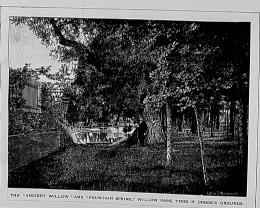










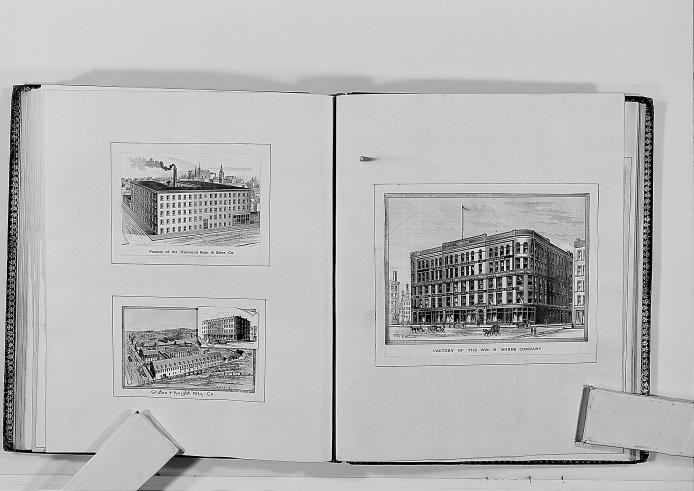


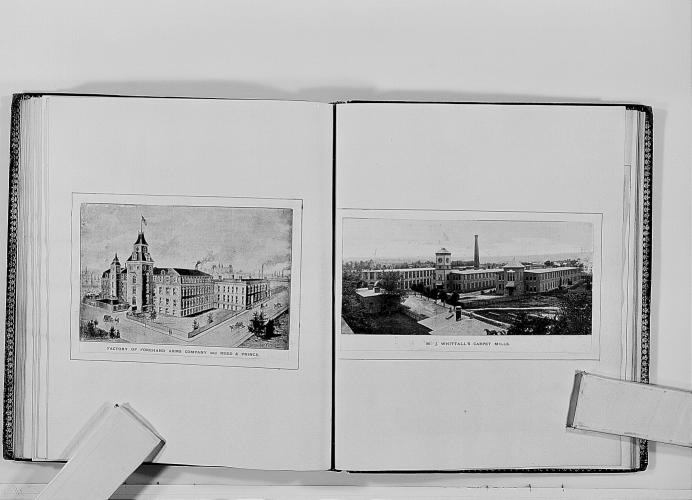
# Washburn & Moen Mita Combany.

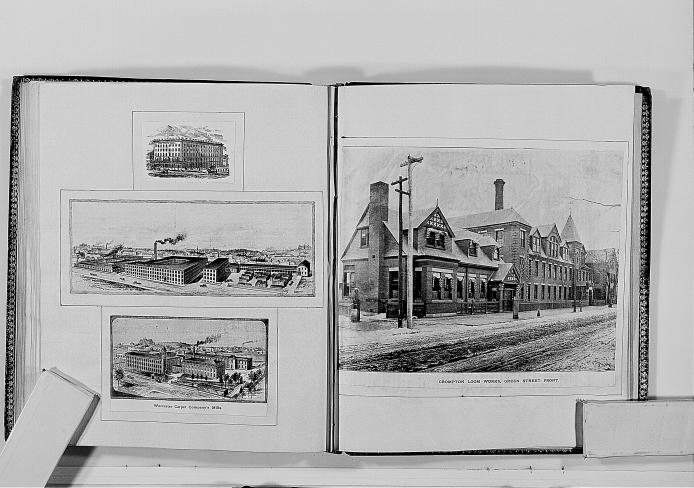


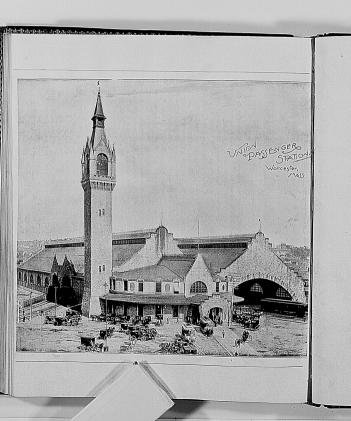


SOUTH WORKS-QUINSIGAMOND.









Sunday Spy. May 17, 1896.

WIZARD EDISON.

Worcester Men Visit Him at His Laboratory.

MAY (3,1896.

ELECTRICAL EXPOSITION.

Some of the sights at the New York show.

Progress of the Work on the new Macomber Chemicalizer
at La France Works.

Dr. W. H. Raymenton and Clarence R. Macomber have just returned from a week's trip to Elmira, N. Y., relative to the final work on the Macomber Chemicalizer, the new fire fighting machine, now being built for them by the La France Fire Engine Company.

They found the machine nearly completed, and all that remains to be done is the putting on of the gun metal and copper ornamentations, colored glass side lights and lanterns, metal blanket case, gold eagle, rotary gong, name plates etc.

The iron parts of the frame work are to be painted in white and gold, and the running gear a rich carmine. These colors in combination with the highly polished metal parts, will make a very beautiful effect.

The machine will be furnished with a three horse hitch,

and the team will be completed with three coal black horses, with gold mounted harness, having white and gold collars.

Dr. Raymenton and Mr. Macomber, are enthusiastic about the machine, and declare that the La France people are building for them the handsomest piece of fire apparatus ever turned out of any works. They also assert that the entire outfit will be the most showy and elegant fire department hitch in the world.

Capt. Wm. Falck, the treasurer of La France works, has just returned from New York and Brooklyn. He stated that Mayor Wurster, Fire Commissioner Eryant, and the Fire Chief of Brooklyn, and also Chief Bonner of New York were all much interested in the Macomber Machine, and promised him to do all in their power to give it a good test in their cities.

On the return trip home Raymenton and Macomber visited the Electrical Exposition in New York, and also had the pleasure of an hour's interview with Thomas A. Edison at his laboratory in Orange N. J. Speaking of this visit, Dr. Raymenton said:

"Taking an early morning ferry boat for Hoboken, and from there by train, an hour's run brought us to Orange, N. J. the home of Mr. Edison. After ten minutes ride on electrics we found ourselves at the gateway of Edison's laboratories.

This was locked, but a press on an electric button brought

a watchman, who admitted us to the grounds. Being ushered into Edison's library, and producing cards we were left by ourselves.

After a few moments the card bearer returned, saying Mr. Edison would see us in half an hour, and then left us alone to roam about among Edison's books and treasures.

This opportunity allowed us to take a good mental photograph of Edison's den (if a well appointed scientific library can be called such.)

This room is finished in natural wood of a hard variety and has two galleries running entirely around it.

At one end is an immense mantle and fire-place, having gas logs as large as grandfather's cord wood. Over the mantle is a large clock, face of carved wood, and the hands coming from a large carved sun burst. On the mantle is a statuette of Sandow, and beside it is a bust of Humboldt, indicative of physical and mental strength and superiority. Then there is a large mounted American eagle and under the eagle an owl, symbolical of power and wisdom.

About the room on tables are phonographs in different stages of development. In the center on a pedestal is a life size figure in marble called "Italie"- a graceful, boyish figure, having wings and holding in his hand high above his head, a large Edison incandescent lamp.

On the walls are portraits of renowned scientists such as Watts, Bunsen, Magnus, Hirchhoff and Liebig. Also two fine views of Edison's beautiful home, Elemmont in Llewellyn Park, Orange, N. J. In a small frame is the following: "The surrounding outfit of library conveniences are presented on the forty-second anniversary of his birth-day, to Mr. Thomas A. Edison by all the present and a few of the past workers in his laboratory. Orange, N. J., February 11th, 1889."

This makes Mr. Edison's age at the present time, fortynine years. We found a last year's Edison straw hat on one of the shelves and it being about our size, 7 3/8, we took pleasure in trying it on and had our pockets been a little larger we might have brought it away as a souvenir.

Mr. Edison's employees have the free use of his library; the use being governed by a few simple rules. Mr. Edison's "half hour" contains just one hundred and twenty minutes, and at the end of that time he came and greeted us with a happy smile and a cordial handshake. He had not forgotten his visit to Worcester in 1884, and spoke of the good time he had when here at the electrical exposition given in Mechanics Hall by the Natural History Society and the Mechanics' Association.

He has grown gray since that time, his hair being thick and quite long, of a silvery shade, each hair standing up as if electrified. His face, however, is still youthful, almost boyish, with a healthy color, and his gray eyes are as bright and penetrating as ever.

He was dressed for work, had on a faded pink shirt of the negligee order, with collar secured by a narrow black tie, no buttons in the cuffs, and a black cutaway coat over it, giving the impression that he had just rolled down his shirtsleeves and slipped on a coat before presenting himself.

His hands showed that he works with them as well as with his brain, being slightly begrimed, yet these same hands were slender and delicate with taper fingers, and almost showing the intellectual gray matter in the tips of them.

Drawing up a chair he seated himself directly in front of us and gazed at us with an expectant, intense expression on his face, saying without words, "well, what can I do for you?"

We told him our object in coming to him was our desire to learn if he had ever paid any attention to the subject of extinguishing fires by chemical processes. We then told him of our work and explained the principle of the Macomber Chemicalizer and the action of the chemicalized stream of water when coming in contact with the flames. He told us that the matter of fire extinguishment was out of his line, but that he was "a kind of a chemist," and it was remarkable to see the way he grasped the subject and his manner of handling it.

He agreed that water was a mighty poor fire extinguisher and said that it was absolutely necessary to completely drown a fire by the use of water; and he further agreed with us by saying "water thrown on the hot coals of a fire and on the superheated iron work of burning buildings, actually adds fuel to the flames by being instantly decomposed and at once turned into highly inflamable gases."

"But," said Mr. Edison, "I believe you have solved the problem in a right and scientific manner. You put into the full sized fire hose large quantities of chemicals, which coming in contact with fire, liberates large volumes of fire-killing gases, and you also get large amounts of enameling vapors which must completely coat over all parts of a burning structure. It looks to me a great advancement of present methods of fighting fire. You do it on a large scale, and I have no doubt of its success."

It is an inspiration to talk with such a man, and while he listens like one to whom is being imparted new truth and knowledge, you feel at once that he has anticipated what you were to say; and when he gives an opinion, that it is a safe and masterful one. After about an hour's talk he suddenly arose and saying, "Well, gentlemen, I must go to work," he bid us good day, and as he left the library and entered the stockroom, where one can see almost everything necessary for scientific research, we heard his pleasant voice saying to an as-

sistant, "Tommy, have we any bichromate of potash on hand?" showing that his mind was instablly again on his experimentations.

While waiting for Mr. Edison, a lady drove into the laboratory grounds, seated in an open carriage, drawn by a fancy matched pair of beautiful horses, with a driver in livery.

It proved to be Mrs. Edison, a young looking woman of pronounced brunet type with a handsome and pleasing face.

She had brought Mr. Edison's luncheon, and we were told that when busy with his experimental work he would stay for days at a time at the laboratory and never once think of leaving it. He is now intensely absorbed with X-rays work.

We left Mr. Rdison feeling that we had indeed been privileged in being able to enjoy the company, and breathe the atmosphere of the greatest scientific intellect of the century.

Returning to New York we visited the Grand Electrical Exposition being held in Grand Central Palace near 42nd street on Lexington Avenue. This is under the management of Frank W. Hawley, the vice President of the Cataract Electric Power Company of Niagara Falls, who received us very kindly and paid us marked attention, showing us about the exposition building and explaining many things of interest. This exhibit is well worth visiting.

There is shown a model of the big electric power plant at Ningara Falls, 460 miles away, over an ordinary telegraph wire. By means of a telephone one can distinctly hear the roar of Niagara, transmitted over the same wire.

Then there is a model of a canal boat drawn by an electric motor, running on a trolley wire, and pulling the boat through the water. Mr. Hawley told us that they were already operating twelve miles by this method, and that the canalboat horse and driver had "got to go."

Another interesting feature is the sun-light room; a darkened room that is lighted by electricity in tubes about the room and giving the effect of sun-light. The operator stated that very soon all houses and stores would be lighted with this electric sun-light.

In another part of the building can be seen the Roentgen X-rays and everybody visiting the exhibition can have
the pleasure of viewing his own bones without extra charge.

After gaining admission, the price of which is half a dollar,
everything is free. Mr. Hawley took us down in the basement
and introduced us to the woman engineer or engineeress.

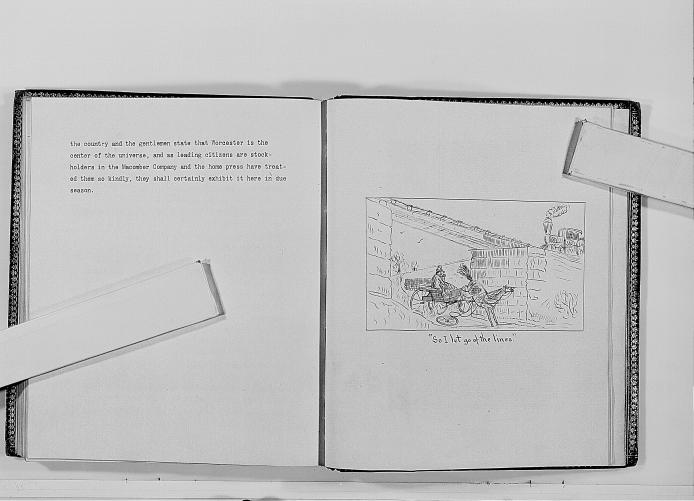
This is a type of the new woman we had not before met. We
were also shown the signature to the telegram to be sent around the world on Saturday evening, May 16th, by Chauncey
M. Depew, at the exposition.

It is to be sent from one end of a table, travel over the wires sixty-eight thousand miles, and will be received in forty minutes at the other end of the table by Thomas A. Edison, who has kindly promised Mr. Hawley to be present and receive the message from the sounder.

This message while travelling, will be taken off at 12 different telegraph offices in as many different parts of the world, and published in the next morning's daily papers, in as many different languages. Mr. Hawley also had Mr. Depew's speech in his pocket, but was very careful not to let us or any of his officers read it or the telegram, and stated that the New York Journal had that day offered him 2500 dollars for them, but he told them that not for \$25,000 could they see them until after Saturday night.

Mr. Hawley told us that after the event all the instruments used, Mr. Depew's speech and telegram, with photographs of Edison and Depew would be authentically labeled and presented to the Smithsonian Institute at Washington, thus perpetuating the sending and receiving a telegraph message the longest distance ever wired.

Dr. Raymenton and Mr. Macomber expect the new chemicalizer will be finished by June 1st. The question has been asked if the new machine will be brought to Worcester. It is the intention to exhibit it in the principal centers of



Here are two more of our "Moving Pictures of History," intended to show how men progress, AND HOW FAR THEY MAY HOPE STILL TO GO.

You see here two pictures of lightning and its power in the history



First, the lightning's flash terrifies the ignorant savage. He crouches in dread, he sees a mysterious god in the lightning. He begs

delice and secure sections of the second

common in creat, he sees a mysterious god in the lightning. He begs for merry, and promise to the wavege pol, created by manage brain and ignorant fear, all kinds of savage rewards for antity. The savage promises that he will kill all not can distribute the properties that he will kill all not seen that the first the first the first the savage of the properties that he will kill all not be the properties that he will kill all not be the properties that he will be the properties that he will kill all not seen that the savage of the properties that the properties are the properties and the properties are the properties are the properties are the properties are the properties and the properties are the properties and the properties are the propert



History moves, and the next picture shows you Thomas A. Edison to-day and the lightning as man's intellect near it to-day and the lightning as man's intellect near it to-day of the lightning. The state of the contribution of the lightning of th

Boston american, ang. 13. 1909

## SUPPLEMENT

**UNBOUND CLIPPINGS SERIES** 

EDISON'S INVENTION OF THE KINETO-PHONOGRAPH.

In the year 1887, The idea occurred to me that it was possible to device an instrument which should do for the eye what the phonograph does for the ear, and that by a combination of the two, all motion and sound could be necorded and reproduced smultaneously, This idea the germ of which came from the little loy called the Zostrope, and the work of Muybridge, Marie, and others has now been accomplished, so that every change of facial expression can be recorded and reproduced life size. The Kinetoscope is only a small model illustrating the present stage of progress but with each succeeding month new possibilities are Grought 2 believe that in coming years by my into view . own work and that of Dickson, Muybridge Marie and others who will doubtless enter the field that grand opera can be given at the metropolitan Opera House at New York without any material change from the original, and with artists and musicians long since dead. The following article which gives an able and reliable account of the invention has my entire endorsation The authors are peculiarly well qualified for their task from a literary standpoint and the exceptional opportunities which Mr Wickoon has had in the fruition

Shomas a Edison

Century majorga ACCOUNT OF THE INVENTION.1

THE synthetisem statistics of phong in properties of the propertie



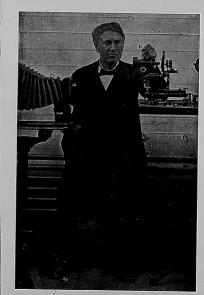
mediane," In the photochemistry, and the proposition of the authority of the dependence of the proposition of the proposition of the dependence of the proposition of the dependence of the proposition of movible using the proposition of the proposition of movible using the proposition of the proposition between the proposition of the proposition of the proposition between the proposition of the proposit

of the work.

EDISON'S INVENTION OF THE KINETO-PHONOGRAPH.

near when it because a quastion of enharping the pin-point phote planty of the property of the pin-point phote planty of the pin-point phote planty of the pin-point phote planty of a spanning the pin-point planty and it was resoluted to revolutionic the whole matter of the proceedings by design the produced a prapture of the printing wire of which, operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-produced a prapture of the printing wire of which operated by the pin-printing wire of which operated by the pin-

The next step, after making the negative band, it to form a positive of institute of the properties band, it to form a positive of institute of institute of the properties of the case may be. When a phonograph record has the case may be. When a phonograph record has the case may be. When a phonograph record has the case of the properties of the case may be with the case of the properties of the case may be with the case of the properties of the case of the properties of the p this otherwise carry, mat the stude of the order of the compaction of the compaction



THOMAS A. EDISON, 1893.

210 EDISON'S INVENTION OF THE KINETO-PHONOGRAPH.

THE ENDETO-PHONOGEAPS.

The mass everyplean steps of adjustment has been achieved, with the resultant effects of realistic, andibly, and visually expressed, it, andibly, and visually expressed, it, and the control of the control of the resultant effects of realistic expression of the resultant ender the photographic department, or by dryling tunder the important endorstant ender the particular states of the resultant enders of the resultant expression expressio

kinetocopic methods is in the form of the well-known makes in-baseling, manetic consisting and the control of t



----

EDISON'S INVENTION OF THE KINETO-PHONOGRAPH.

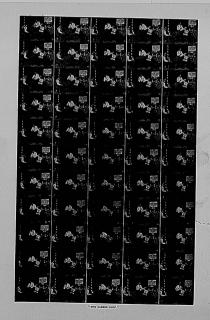
212 EDISON'S INVENTION OF THE KINSTO-PHONOGRAPH.

The phonographic attachment, have removed the phonographic attachment, have removed the last turce of automatic action, and the filtsleast turce of automatic action, and the filtsjumpus upon his shoulder to the forecompaniment of a strain form Vision and the filtsjumpus upon his shoulder to the forecompaniment of a strain form Vision. The proper partie formatic action in the filt in the full power of a strain form Vision. The filts of the beat argued to the record power in the filt in the full power of the forecompaniment of the filt in the full power of the filt of the filt in the full power of the filt of strain formatic action of light and shade is the filt of the filt in the full power of the full power o

which a mix contraction of a special building which a mix contraction is extended from any contraction in the context of that chance of a plane of mixing lead of the contract of the chance of a plane of mixing lead of the contract of the chance of the ch its material is paper, covered with pitch and profusely studded with tin nails. With its flapthe magness is paper, covered: with plots and implicit and proposed in the pro

myammes measure on the tained go left solve-their intense agent paralleg paring size the care to work as signessize under doubth? Gentlement in their intense agent paralleg paring size the care to work as the care to the care their intense agent paralleg paring size the care to the care to the care the care

terests of science. One furry monster waddled up a telegraph-pole, to the solitoury of his own indignant growls; another settled himself comfortably in a deep arm-chair, with the air of a postgraduate in social science; a third rose solemnly on his hind legs and described the measures of some dance, to the werd strains of his keeper's music. Another lecked his mas-



difficulty was experienced in obtaining a perdifficulty was experienced in a contract of the period of the EDISON'S INVENTION OF THE KINETO-PHONOGRAPH."

Antonia and W. K. L. Dickson,



AND THE COMMERCIAL (DISOLIDATED.)

TRIBUNE

# 2.800 COPIES

CIRCULATION OF THE

TRIBUNE

\$1.00 PER YEAR.

PORT HURON, ST. CLAIR COUNTY, TURSDAY, FEBRUARY 21, 1895.

ALL THE LOCAL NEWS.

REV. PRANK HOTT, OPERATOR Barnum's circus will be here in Aug St. Clair river is now open as far own as St. Clair flats. Mrs. Lizzie Paulos, of Capue, sent to the Paulou Asylum.

sent to the Paulian Asylum.
Mrs. Phillip Kessell, of Union Si.,
Is yery Ill.
The gutters along Military atreet and Hijron Ave. were elemed last week.
A large ausum of coal ashes has been plat out the track at Pine Grove Park. put of the track of Pine Grove Park.

EThe Baer block will now be known
as the Chamber of Commerce building
The Democratic State, Conventior
will meet at Saginaw next Thursday
Feb. 28th.

Jos. McFarland of E. N. Akers gra-ceer will fravel for the Cream Yeast Company. "The owners of the Huron Hense have been notified to put five escapes at the windows of the hotel.

R. B. Falrman was re-nom School Commissioner at the ean convention last week.

The A. O. H. of this eitr ave mable great preparations to Patrick's Day here.

Patrice's Day here.

A. B. Palmerley, of Armania, has been appointed hay impactor at Per-Hirron by the Chamiler of Commerce, Valentine Baker has retirved from the hotel bounders. Clins, Hill will now conduct the Grand Central alone.

Mas Mand Wallace has accepted the the position as steagething for At-kinson & Wolcost.

W. E. Leonard asks the City Connell for \$125 damners for spraining his wrist by falling on a defective side-walk.

Tambury evening.

Secondary the variety of secondary to the properties of the proper

PRUL 25 PERC

UNDER THE SEARCH LIGHT. BEV, FRANK IN.

AND LECTLIBER.

"Under the Search Hghi" was the taking and catchy why that a town place accompleted and manifact even place accompleted and manifact even in the City, Open which we will be a subjected to be a subject to the city of the country with the city of the country with the city of the country with the city of the cit

FELL 15 FEET
Miss Alice Wood, while
Anderson's carriage factor
a platform abel landed on
a platform abel landed on
to lier home on Lapeer avi
she is recovering.

HORSE RACING ON ST. CLAIR.

The mees which took place on St.
Chir river near Marine City inat week
were witnessed by nieur 2500 neople.
west down to see the Hurse sports
west down to see the
west Step Step Step Step Step
Line Hurse got Hurse money.
Rest thing
touted was 2501 22.

well.

Off. G. R. Bessa. Severiny of the first Marcubose with theirbow down of the first Marcubose with their weight in Locales. The first Company, and the first Marcubose with their weight in Locales. The severe will be severed with the severe will be a first war and the first benefit with the severe will be a first war and the first benefit with the severe will be severed to the severed with the severed will be severed to the severed with the severed will be severed with the severed with the severed will be severed with the severed with the severed will be severed with the severed

James Watson, of Sarain 23-foot senffolding while p elling of the Congregatio FELL 15 PRE

GOOD NEWS FOR MANY POR HURON RAILROAD EMPLOYES

The rullread shops in the horthern part of the city began run ulug on a nine-hour schedule and six days a week, Monday. The men have been putting in but, twenty-eight hours a news and the change is halled with HORSE RACING ON ST. CLAIR

A SINGULAR CASE.

A SINGUIAN CASE.

Mrs. Peter Ovarial living area Lenot was taken with convulsions and died may be a living to the living the living the living the living the living the living taken when the living the living

CAN TEMPER COPPER. CAN TEMPUR COPPER.

Wm. Ransey of Owcose, claims it has yet discovered the lost art of tanique large capper. He has been allet, as the result of years of search, to preclaim chisch, knives and other articles ministrated. thred from copper, which can be ground down to an edge as keen as the fluest steel. He has a copper chirel with which he has severed an iron bar

ATHER EDISON.

H BY JAS, SYMINGTON. THE EXARD'S PROGENITOR AND HILLIFE AT PORT HUBON.

TERISTICS AND PERSON AA OF THE ELDER D) EDISON/



#### [George Parsons Lathrop. "Father Edison." From Weekly Tribune (Port Huron, Michigan) 1

TEACHERS EXAMINATION.
The teachers' regular examination will be held; in the Second, Ward 19 he was a second of the second ward of the second ward of the second of the se report the same at once and ob-Yours respectfully, R. B. FAIRMAN.

I. B. PAIMAN

FUTURE SINTER SEVENTH AND

BIGHTH GRADE EXAMINA

A extensible of the State, Seventh

A extensible of the State, Seventh

Market in many parks will be stated to the State Seventh

Market in many darks of the State Seventh

Market in many darks of the State Seventh

Market in many darks of the Control of the State Seventh

Market in the State Seventh

day aftermoon from the house.

Mrs. O. W. Tennant, of Cupac, died Polarany 7, after a sever illness fot ten days' duration. Mrs. Tennant was just 51 years and two mouths of age. Her husband and six children surviv, hoe.

species of course for the street was a second of the course of the cours

THE MARRIFOX PRIMATIONS CO.

The Marrian, Prophysics, Gondon's on the part of the property of the part of the part

PURCHASED THE BRYCE BLOCK. PURCHASED THE BRYCE BLOCK.
Mr. Harvey Huseh has purchased from Mr. David Bryce his block que the corner of Millistyr and Water streets. They free piled was 250-milled to the corner of the corner of

6.241 VOTERS IN PORT HURON. G.211 VOTERS IN FORT HURON.
City Clerk Wagessed has forwarded to the Secretary of State the namber of voters in the different washs of the city, as follows:
First ward 52
First ward 54
Fourth ward 6,007
Fifth ward 7,007
Fifth ward 32
Secreth ward 33
Secreth ward 33
Secreth ward 36
Secr

Yalikee gunners are having great port chasing ducks in the onen water

Conductor Tom Johnson, who use to run on the Chlengo & Grand Trun rallroad and who wont in the stril last summer, thinks that he is obvious state remanuer, children that he is playing the common children that he is playing to a simple the matter of the common children to go on on surface. Mr. Johnson to go on on surface, Mr. Johnson to go on on surface, Mr. Johnson to go on the Canada (Tranda, Law Common Common

Finisher over and fest summer for the state of the state



## **SUPPLEMENT**

**COMPANY RECORDS SERIES** 

NEW JERSEY AND PENNSYLVANIA CONCENTRATING WORKS

# NEW JERSEY AND PENNSYLVANIA CONCENTRATING WORKS PLANT OPERATIONS RECORDS

#### Pocket Notebook, PN-99-06-22

This pocket notebook covers the period December 1888-January 1900. The entries in the first part of the book are by Edison and Emil Herter, chief draftsman at the ore milling plant in Ogden, New Jersey. The remaining entries (not selected) are all by Herter. The Edison material consists primarily or notes regarding the operation and performance of conveyors, rock crusters, or notes of the primary possible of the consistency of the primary possible or primary primary

#### PLANT OPERATIONS RECORDS NOT SELECTED

Several additional documents from the New Jersey and Pennsylvania Concentrating Works Records that were uncovered since the filming of Part III have not been selected because they contain routine information or duplicate records found elsewhere.

#### Notebook, N-91-08-00

This notebook covers the period August 1891-February 1899. It was used by Francis R. Upton to record sales of ore concentrate and sand. Included are details about purchasers, volume, and date of sale. Similar information can be found in "Sales Abstract #2" in the NJPCW Sand Sales Records (Thomas A. Edison Papers: A Selective Microfilm Edition, Part III, 154: 679-744).

#### Pocket Notebooks, PN-00-01-03, PN-00-05-11, PN-00-07-10. PN-00-09-20

These pocket notebooks cover the period January-September 1900. They were used by Emil Heter, child refartsman at the Ogden plant, serving in the capacity of a mechanical engineer. The books contain primarily notes, drawings, and measurements regarding buildings and machinery. Included is material relating to conveyors, elevators, and roils. The activity recorded in these books corresponds with some of the subjects discussed by Horter in Thomas A. Edison v. Allis Chalimers, et al.

#### Pocket Notebook, PN-00-09-14

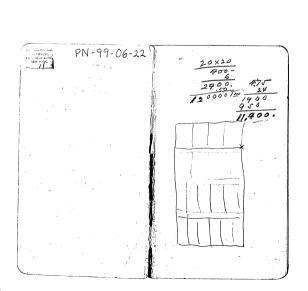
This notebook covers the period September-October 1900. It contains notes about mine cuts and ore assays from samples taken from trenches at the Ooden mine site.

#### Tracings Ledger (1893-1903)

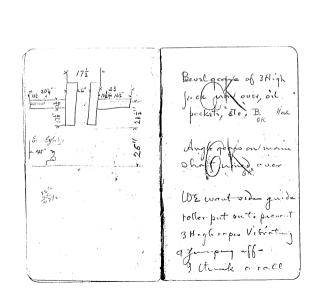
This ledger covers the period April 1893-June 1903, It is an index to about 3,000 linen drawings, a small sample of which can be found in the NJPCW Plant Operation Records, Thomas A. Edison Papers: A Selective Marcofilm Edition, Paper III, 151: 194-50. Included is the drawing number, description, date, and drafter's name. A few pages contain notes and drawings pertaining to company equipment and buildings.

#### New Jersey and Pennsylvania Concentrating Works Records Plant Operations Pocket Notebook, PN-99-06-22

This pocket notebook covers the period December 1898-January 1900. The entries in the first part of the book are by Edison and Emill Herter, chief draftsman at the ore milling plant in Ogden, New Jersey. The remaining entries [not selected] are all by Herter. The Edison material consists primarily of notes regarding the operation and performance of conveyors, rock crushers, rollers, hoppers, pulleys, and belts at the Ogden plant. These notes contain many suggestions and proposals for improvements to the machinery. The entries by Herter are mainly notes, drawings, and measurements pertaining to buildings and machinery. Included is material relating to conveyors, elevators, and rolls and machinery recorded in these books corresponds with some of the subjects discussed by Herter in Thomas A. Edison v. Allis Chalmers et al. (Thomas A. Edison v. Allis Chalmers et al. (Thomas A. Edison Pagers: A Selective Microfilm Edition, Part III, 118: 887-929.) The front cover is labeled "9." The pages are unnumbered. Approximately 100 pages have been used.



Hear whyels of No 3 Congress of bs encour. m ( both lightle oice WE way have to balt tumbon to haldeng Juckstraft of 3 Hogh The pencar house a power when the



Sic. for 1898 Porter, 1800ble.

Sini Shall ASS The Sort of the well of a proposition of med hat loved roll of near hot loved roll.

Thereof Court for of well be to be any if of well be to be momentary touch Us have had a shut closure or account of none or account of none or account.

Amelhat the will

otop at but themk it

will

Disagnothe check

piccos — also the

both piccos — the hoppen

Should be an a back

so they can be a grandly

south for a sure of form

bened by an a back

the voltage of a sure of form

the voltage of the sure o

Capable of bring Lowers as we may be compelled to cese soft in + the war will be great, Hence the top hoppe May haveto 62 lowers 2" unchow or more to Componente for the custor Ws should no the

The loopper would best by words of wheat can will remember of what is to view and.

The coolders we adm of the comment of the coolders we adm of the coolders we adm of the confidence of the co

pud mas soon as we have time—

Uthink we way have to both down to rock bolow the look of herough the word per as the lefting advant 6 cthe of wobble of months of wobble of months of wobble of months of the of wobble of the period of the period of the period of the period of the of wobble of the of wobble of the of wobble of the of wobble of the

polaplate is ruther Chakey on (activiber of plate was backed down to nock it would nemody the brouble I be awant the Roller fred of 3 High as you have this well The shutter over big

raller feed showed by aff the are perfectly oo no otraggling proces Can get to the rolls Dent forgot that the Chutch for working Jopa Gottan frods from department on com

Siant Rell Slugge Plan We shared have a take up ohr me for the ever rope of the 3 High, when repen Otrike hand of premion cycle luz hour to caplice 224 for Int Rels. 288 " Siens Rels. rope of the taker/2 day - with lake up this would GE Obviation -

24" 1st + Z" 36 -Mandrile laken out + fixed for questo och collar Thrust George pect in Sight ford - bushes vavernice Townster Place for Seems X21/85.

The 9.

The

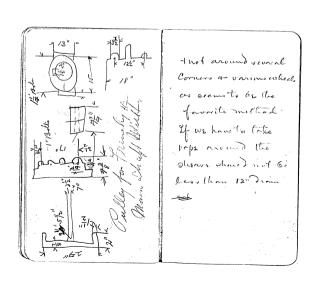
The Idler on 24" is poor see Edward of imported that idler and take up an almosphit line says it go to but line when no load not oblight Enough + it.

Constantly indynated but never stays adjusted but never stays adjusted the Rope has broken twice -

Bug fam dryer!

Are ister of med be put on the fam bet and of hosts by the ister of grant frequently — The ister plant be oright but hight so there is no cross want to know the putter on the ister frame.

The weight should be hard by the weight a opening duest of power ce



Her removable looth

Oprokils to be publin

Oprokils to be publin

One of the spr obstacles

to have an infinite of

Conveyor sprokets

Conserved and Conserved

General and Conserved

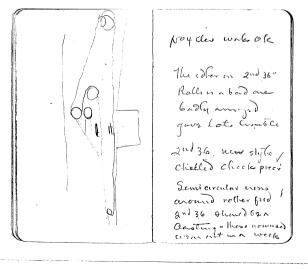
General and Conserved

General and Conserved

Covers Of

There is too which rips down

also that all belts
un will showed have
lightness properly
droughed to primet
Cross view of properly
wing that denot as
through represent
from conveys he ad
soft of the to be
Defined with
Eles Robert properly



2nd 36 Rolle -Reported Heat two morkebotto on been replaced sence sheateter plate was shifted, forma onys plate Report Days Drive puller Loose, I the upoled

a Door should

Grant whole

all the Rall

happen for of 1st 36

Ralls should be

Changed to a swing

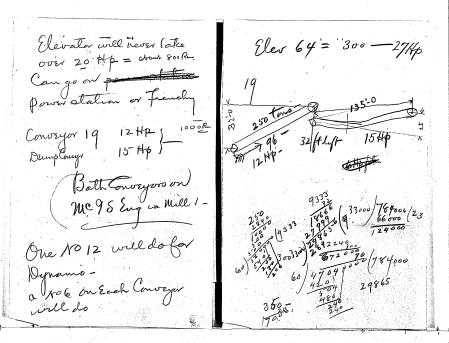
color—

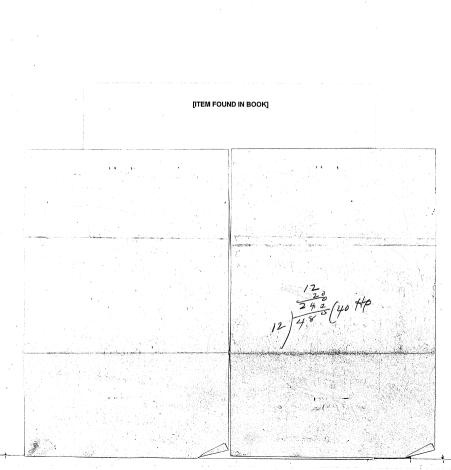
Intermed , ale Bushis token mt 4 Oil devices altoched, pellow 6 Cook dutie) ya oil pope - quene podect arrayed with pope for water out -Sheet of celt door quand putous unde brang

frichmdrums to have rope provided with abotton device for regulating pressure on when to tell him fries by position pressure by position by position fries made provided from the position of the position of

Idler geving town to batt driving Interior walls not want & Daniller, batter -

## [ITEM FOUND IN BOOK]





# SUPPLEMENT

# SPECIAL COLLECTIONS SERIES CHARLES BATCHELOR COLLECTION

#### A Note on the Filming of the Batchelor Scrapbooks

Although each scrapbook page is represented on the microfilm, the contents of the scrapbooks have not been filmed in their entirety. Some of the pages contain oversize clipings that cannot be completely unfolded without obscuring other clippings. Each scrapbook page has been filmed at least once, in such a manner as to convey the greatest amount of bibliographic and substantive information about the clippings on the page. All substantive clippings directly concerned with Edison have been filmed in their entirety except for a few large newspaper pages that are too britte to unfold.

### Charles Batchelor Scrapbook, Cat. 1346

This scrapbook covers the period 1890-1894 and contains clippings about a variety of subjects. Included are newspaper interviews and profiles of Edison. Other Items pertain to the formation of the General Electric Co. and the personal and financial consequences for Edison; the financial affairs of the Westinghouse Electric Co.; and the decision of the U.S. Circuit Court of Appeals in the patent infringement suit, Edison Electric Light Company v. United States Electric Lighting Company. Additional clippings relate to aerial navigation; the disappearance of Edison associate Frank McGowan; and Edison's iron ore concentration plant at Ogden, New Jersey. Also included are an 1890 letter of introduction written for Batchelor by the Clison; a passport Issued to Batchelor by the U.S. Consulate in Athens, Greece, in 1893; passenger lists from transatlantic crossings, and invitations to various social events. The spine is stamped "Scrapbook 1890." The book contains 133 numbered pages. The clippings are individually numbered 2999-3202; some terms are missing.

on Uncle Sammy Edison-The Scotch Lowrer in Ructond.

Who has not beard of Goun's Index? It to published in England and Scotland, and scattered brondesst over the United States. It purports to give a list of wealthy men who have died in England, Scotland or other countries, and left large fortunes to helrs residing in America. Gunn mails these eleculars to this country, setting forth that they "can learn something to their advantage by ap-plying to Robert Gunu; No. 6, Prince of Wales Road, London, England,"

James Symington tells the following

story, relative to Gunn, which will be read with interest in this city and Port Gratiot, "In the year 1884 Samuel Edison, father of the illustrious inventor and electrician, was showif, one of Gunn's Indexes with his name there as one of the lucky parties who was soon to roll in wealth if he would only consuit Robert Gunn. He paid attention to this for the following reasons: His fore fathers had been in the grain trade in Am-sterdam, Holland., for two conturies, but the branch to which he belongs left for the United States in 1733 and his grandfather was a banker in New York during the Revolutionary war.

"About 25 years ago an officer from the army of Helland settled in Seginaw and coming accidently in contact with Mr. Edi-son told him that the firm and family of Edison had died out in Amsterdam leaving no heirs but a large emiount of property and money. These two coincidences seemed to warrant an inquiry and investigation. Ac-cordingly Mr. Edison naked me if I would write to Quan in his behalf. The result was five lotters from Gunn, which for power of lusinuation, craft and inct and brazon audacity were warthy of an old veteran who analogity were warthy of an one veteran who was a uses takiled and protound dector in the art of invelocement. He assured as that it would take from the to \$100. to examine the records but if Mr. Edison, would send \$50 to beigy and allow, ten per cent; on the contract of the contract o too bely, and allow the part cest, on the first theory, and they are cest, as all above, that can be would give it this can be about that can be would give it this can be about that can be would give it this can be about the Eules according to the same of the Air. Eules according and it seek the garden that the best discovered in the half provinging. He got a statement of the construction of the same and taken up the same and the same and the same construction of the same and the same passes that the particular of the same control of the same and the same passes the particular of the same and the same passes the same and the same and the same passes the same and the same and the same passes the same and the same and the same passes the same and the same and the same passes the same and the same and the same passes the same and the same and the same passes the same and the same and the same and the same passes the same and the same and the same and the same passes the same and the same and the same and the same passes the same and the same and the same and the same passes the same and the same and the same and the same passes the same and the

CHILLEN TO THE

"Upon pointing out this inconsistency or fraud I got a most audacious letter, stating that he was not half compensated for his labor. However, in the fall, under the suspices of his son, the inventor, Mr. Edi-son and myself made a trip to Europe, I took the letters with see to bring Mr. Guen to time. We called at London to see all the wonders there. By the way we called upon Gunn as we had come with power. There was the same audations bearing and pre-tense that he had done his duty and was not half paid for this laber, but I soon exof his letters and the published pretense upon which he had obtained the \$50. He became very pule and saked Mr. Edison into another rood; Said Gunn: Who is that gentleman with your Edison, who is a humorist, informed thim that I was a Scotch lawyer, and that whatever I touched Scotch iswyer, and that whatever I couched she bair was certain to come off. The effect was magical. He came out as pale as death and could scarcely speak. He had a vision of arrest, the 'recorder's court, punishment for obtaining 'money on faite pretentes, and the whole game 'exploded by public exposure. He faitered out that there had been a mistake, and that he could pay back the money and gave me a paper b

read while he went to the bank.

"During his absence I counseled Mr. Edi-son not to accept the money. Ist. Because Gunn was not in the proper frame of mind to be dealt with. 2d. The baleful environwho clearly with. All repose thems of mind we would be compared to the control of nd to get rid of us.

goat to got rid of us.

"I have, thus made a full expours of this fraud. Now let the press. In both countries pass this matter could so that parties in the fubers who may see their names. In Gunn's linder, with weap their money at home."

IN NEED OF MONEY. NYThibune Dec 5 1890 3000 ELECTRIC CORPORATION.

THE WEST NOROUSE COMPANY PREMISO THE

EMPROTS OF THE STRINGENCY IN THE MONEY MARKET.

1. MONTH MARKET.

"History, Low-dipotan Electric Company, in which many in Westpilopana Electric Company, in which many in Westpilopana Electric Company, in which many in Westpilopana Electric Company, in which many in Westpilopana, in Westpilo ment. "He mait: "it is not a spection of solvener, The circle-give has measurement shall be pre-pared to the common shall be sh The direction of the company have made an effold-ing even many in carrying on the investment particular and even many in carrying on the investment particular direction of the company of the carrying of the investment of the company in the exercise to the company of the carrying of the carrying of the carrying of the stockholen has been ex-tended for this purpose. A proposition will be suf-ted to the purpose, a proposition of the carrying of the carrying of the stockholen has been ex-manded and the carrying of the stockholen has been ex-manded and the carrying of the carrying of the particular of the particular of the carrying of the larger in the carrying of the carrying of the particular of the carrying of the carrying of the particular of the carrying of the the carrying of the carrying of the carrying of the the carrying of the carrying of the carrying of the the carrying of the carrying of the carrying of the the carrying of the carrying of the carrying of the the carrying of the carrying of the carrying of the the carrying of the carrying of the carrying of the the carrying of the carrying

MORE CLEARING HOUSE CERTIFICATES.

NO OVE WOULD SAY WHY THEY WERE ISSUED

SIGNER OF CHARMON HOUSE GENTPOATES,
2607 — "LINED SEX WHILE THERE."
The Cinterly lines Association based 800000 in 1900.
The Control of the C

clusion. The stock market was dull and weak throughout the dealings. There was an approved secretly of deals and at the same time to have been able to be a few or the secret of the secret with the secret was a secret of the secret with the secret was a secret of the secret was a secret of the secret was a secret of the secret was a secret wa as set. The returnion in the Note of Engineer is decreased and the causer years for many at hemst abread, ingesther with the bright for the con-stance of the control of the control of the con-ceptance with action abroad control of the con-ceptance with action abroad control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the con-tr

3001 Not Enaily Accounted, Fridame
The miscrebs the is distres. Most //
An equive has a center.
He measures in the streking test // 90
time critifiants of an inch.

N.Y. Tribune Nov II 3003 THE WESTINGHOUSE COMPANY'S APPAIRS.

ager for the company.

The full Board of Managers of the company, at its meeting this morning, resolved to request the stock, meeting this morning, resolved to request the stock, budders to issue \$3,000,000 of proferred steek.

A TRIALLY IN A PERF WEERLS.

A Chairs, Dan <sup>15</sup> Option—In a face weight Born will be without the famings of one of the product of the product of the famings of the control A TRULE IN A PEW WERES.

others. At to-day's assetting the prospects for the enterprise of the control of the property of the enterprise that the since of the thirty was the control that the since of the sings, we make the conduction that the since of the sings, we make the consistent that the sings are the sings are consistent to the control of the control o

3008 MX.Thengli. Letter Judge.
Assuming that Mr. Bovenstan knowledge.
Assuming that Mr. Bovenstan knowledge are a subject of the property of the letter than t ence, in which he figures it out that the world will be as full is it can hold of which the will be a full be a full be a full be present possible of the global present possible on the global present possible on the global present possible on the global full belief on the present possible of the global full belief and reaches the conduction that that enterious in-crease—as fasts in the human race multiplying in their days, when dvillatation is so exceeding these days, when dvillatation is so exceeding influend—with the accordance in a way too evided from this (that the coming man way lookly), this arrival here below to, say, 2009 is not point of mild like worth the Hirds. The constitu-ction of the conduction of the conduction of the consulting to which he is bound (to like subjection). can scarcely fail to make a rank possinist of him

By 2000 the earnest and oftrepeated reque-whose atterance is at present confined to horse-cars and elevated railway trains— Please, nove forward—will be constantly heard, and with an increasing emphasis, all over all lands of both homizanizers.

hemispheres.

What will our posterity of 2,090 do to mitigate the pressure? A series of elevated sidewalks and streets would of course afford temporary relief. But by A. D. 300 all such schemes will prove insides in wome of course anothe componenty result, and consideration of course, if IAE, Daversedo is a Center-try and stated as a gles for entrance to an elevated car to-day; after

side for retizence to an elevated are to-days after.

Inter has been a black. \* Hen, very me and shifted here will be packed on the certifu as classify as suchines gather in their the boxer. \* Now a man desired packed in the certiful and their subject of their ably will begin to take more hopeful views of

future.
Of course this way out of the embarrassmen will not commend itself to the International Peace Society. So perhaps that organization will appoint a committee to device a better one. Ob-viously there is no special hurry, and besides, Mr. Ravenstein may be mistaken.

A CONTRACT VALUE OF THE MATTER STATES.

A CONTRACT OF THE MATTER STATES.

Austria, and 1006 United Flouis. 50 505 51 50 505 51 51 753 52 753 54 755 54 755

3004

The Mark Minner Street, New York, becomber the The Dispectors of this Company have dendered the treasty-label questively devisited of Octor Text (Section Text), the Art Minner of Company of the Company of the Company of the Company of the Company have devised of a 19th Company properly sizely in the company of the Company of the Company of the Company that Reviews of the Company that the Company of the Compa region or features, to use Cortisions of the Art. Historical Staff be said to the action ensuiner and tribitionals staff be said to the Company's Capital Morek breaffer.

The actions of the Capital Morek breaffer.

The action of the Capital Morek breaffer.

Controlled to the Capital Staffer between the Capital Staffer and Ca

J. B. SKEHAN, Treasurer

3008

100Y THE WESTINGHOUSE PROPERTIES. BANKERS AND BUSINESS MEN OF PITTEBURG DISCUSS THESE MANAGEMENT.

DIRECTOR PURIEST MANAGEMENT.
PUBlishing, Doc. See. An entiling of the headers as business men of the city, who had headed done of the city, who had headed done of the city of

Frigating the \$500,000 least Newtonichous Electropic Membersheit Company—emploit Best, 400,000
2001; more recordis. Company—emploit Best, 400,000
2002; more recordis. Company—emploit Best, 400,000
2003; more recordis. Company—employee and company—employee and

DAYMONDONEY OF 17th "EXECUTED COMPANY OF THE "EXECUTED COMPANY OF THE STATE OF THE

THE WESTINGHOUSE COMPANIES. COMMITTEE TO INQUIRD 4XTO THEIR CONDITION

COMMITTEE for Designation 2000 GREEN COMMITTEE for Designation of the committee symbol of principate principate or the committee symbol of principate principate or the committee symbol of principate principate or the committee control of the committee control or committee control o

Westinghouse.
The committee also asks the privilege cities to use The committee also sake the privilege either to use or reluce the ment, and, if deemed avisable, to reor reluce the ment, and, if deemed avisable, to replace for loans, the committee the companies applying for loans, the committee unbalantage relift; a mention underse of the companies unbalantage relift; a mention to the committee unbalantage relifies a mention to the committee of the committee of the companies of the three committees are committeed as a mention of the order panie of the Nationage consequence. The feven must
be a mention of the committee of the co HENRY SCHLIEMANN

MENKY SUPLEMENT Sec 25 1/00 MEATH-OF THE MAN WHO REDISCOVERED ILIUM.

TIS OWN ACCOUNT OF HIS LIFE-INCODENTS OF HIS EXTRAORDINARY AND

\* ROWANTIC CAREER Berlin, Dec. 27.—The death of Dr. Henry Schlie-

mann, the archaeologist, is announced, At a basquet given by the Grocers' Company in £endon on the night of May 27, 1877, Dr. Schliermann, John was the graced of the company, in responding to the tested of his knutch, gave the following account of

posterio an un terminal e del 200 CT. (1977). De collemente posterio del 200 CT. (1977). De collemente posterio del 200 CT. (1978). De collemente posterio del 200 CT. (1978). Del 200 CT.

On his nonder's death that hely went to live with an uncle, a clergyman of Kallissert, At ern he wroke for his father in tent Lettin a description of the Technuck of the State of the Stat

The Control of the Co

cettar with 76s master, Schillemann broke a blood-vessel in the breast while attempting to 10% a learned, vessel in the bessel words attempting to the a larger of the control of the contr

SOID 2. (CIT BEAT MANIELLA PROPERTY AND A STATE OF THE AND A STATE OF

5013

. . . . . .



M. la due d'Austrila. M. das Cloizeaux. M. Goussel. M. Janvern 1, 22 — LE PHONOGRAPHE A LA SÍANCE DE L'ACADÉMIE DES BEAUX-BATS (27 ANNIL 1889)

NICKEL-IN-THE-SLOT PORTRAITS.
N.Y. Tribune. JOM 2 1891
SIT DOWN AND GIT A PICTURE OF YOURSELF IN

The Late of the Accession of Workshold and State of the Late of th

3016

A Theatre Audience in Darkness.
[GOSLAYS GRAN REWS SERVICE.]
[BERLIS, Dec 35.—The crowded audience
attending the Resident Theatre in this
city on Christens Eve was forced to sit sity
mitunes in darkness, broken only by the
feeble ray from a lantern phaced on the
stage, the electric light having failed in the
middle of the performance.

The Montana Consolidated Tin Mining Zion Ar Company, recently ascorporated under the laws of Illinois, with an authorized 26c.25 capital stock of \$2,000,000, propose to 1698 work deposits of tin ore discovered in

work deposits of tim of a discovered my value, not specially examinerated, 35 per cent; also provides for manufactures wholly or in part of copper, not specially examinerated, 45 per cent; also provides that if you or more rates of duly should a applicable to any imported article, it shall be classified under the highest; of such rates." The decision is affirmed.

WASHINGTON GOSSIP.

MEN AND AFFAIRS AT THE NATIONAL CAPITAL PRINT 3018 OOLO TO STARRY WAS NOTIFIED CULTURE

CARROLL'S EXPERIENCES—THE LOTTERY OF MINING, AND THE PART ENG-GASH SYNDICATES PLAY.

Washington, Jan. 6-One of the great arguments in favor of giving Alanka a foun of territal governments is on account of her splitty developing riches. It is said that hat mines abone extile her to contideration. Gold nithing in Alaska is rapidly being developed, but suitl there are better communications established through explorations. better communications established through exploration and settlements of the interior inlining will have to be confined to the coast. The value of minus depends to a great extent upon the general development of the country where they are altituded. For instance, in Children's three are many mines may be seen worked upon markets or assessment of the country of the confined and t uated. For instance, in Chilerais three are many mines now being worked upon rangles in marrow that only a few years ago they were considered vortables? There is one mine now being worked in that State whose one will not clear over 90 that they are true. Under ordinary circum-ciances the cost of reduction would be more than the cost of the cost of reduction would be more than

this. But with the reduction of the cest of liv-ing and of labor, the increase of labor-saving ma-chinery and the facilities given for transportation ekherry and the ficilities given for transportation, be ore in avoice at an average price of 30 cents to the ore in the contract of 30 cents and 30 cents and the contract of 30 cents and 30 cents and 30 cents and the contract of 40 cents and 40 cents and 40 cents and to one of the secondard almost of this newly of-secondard and 40 cents and 40 cents and 10 cents was paid down in notice (each. The English, was paid down in notice) cents and 10 cents and 10

besenft Constitut retreasion, her brown made section about the mining perspects in Abilities and section about the mining perspects in Abilities and Capitalic Carell is a self, two-landscheeping was considered by long abilities of the constitution of the constitutio time the magnificence of the offer is dimmed by a consideration of the fact that under no consideraa consacration of the new time unper to consacra-tion would the Government entitled may offer for the purchase of this Territory. The Captain is indigmant over the course of the Canadians and the English in the matter of the sea fisheries. and the Engines in the matter of the test inheries. He hopes to see a most vigorous polley carried on by our Government. He says that the senig all have their homes on the blands or shores of the Territory. They wind out correlines to see,

and are no more justifiable subjects for our and are no more postifiable subjects for captures than would be the demestic animals of a printe; individual which should by chance stray outside the lines of the owner's includer. He says that if necessary, in the event of trouble, he would he glad to fit out a neivoteer and make it alexant for British merchantmen. He does not fear a war with Great Britain, and thinks that in the event of a struggle we could do them quite as much damage by expiring Canada as they could in damage by capturing attacking our ports.

L.C. Crawford.

3O19 | WESTINGHOUSE'S TROUBLE

FALR OF A RECEIVER FOR THE RESCURED EVE! PAST BY COMPANY. July 1891

Previous Despatch to The Evening Post.)
FITTERUNG, January 15 -- Centrary to expectation, the return to the subscribers of their first subscription to the Westinghouse Relief Fund by the Advisory Beard did not first subscription to the Westinghouse Issued Fund by the Advisory Brand did not wraken the stock from yesterday's fig-ures, when it sold at sorre dellars a share. Nothing else was dealt in at the first call on the Fittsburgh Exchange to-day, and the opening sales were sixty shares at 0)(. This was followed by the sale of 10) at 7 and This was recovered by see anic or not a man-later by 40 at 7%. George B. Hill & Company are buyer, and it is believed to be on account of Beston and New York, the former probably

Predominating.

The general street opinion here is that a receiver would be the best thing for the Electric Company. There is absolutely no doubt about the return by Chairman John Walker of the checks to the relief fund, notwithstanding Mr. Westinghouse's statement to a New York re-porter last night. Despite to The Associated Press

Pirranuno, January 15,-It is generally be-Hoved that there were two reasons that led the Advisory Committee to return the mency to the subscribers, one being that the resolution under which the committee is acting setalled on them the arrangement for the extension of all the claims of general creditors, something that would lead to weeks of hard work, and for that would lead to weeks of any work, and for which the members did not have time. The other reason was that the Committee could not use the money without practically assum-ing the direction of the business of the company, which they did not care to do. The capital stock of the company is \$10,000,000, and the par value of the stock \$50. It is now selling at \$7.

3020

TRUTH ABOUT TIN AT HARNET PEAR.

Tribont — Jau 16 1871
WHAT THE OFFICIAL REPORT OF THE BOUTH DAKOTA STATE MINE INSPECTOR SAYS.

And the property of the course of the course

COATS GERTIE MINE

The Gerbs in Very good geopet. It is do not the great in the great in

It properties to we and allower.

It peace from the Polymer group has Adden

I peace from the control of the Control

The Adden has the control of the Control

The Adden has the control of the Control

The Adden has the Control

Th

The state of the s NEVADA MINE.

3017

. 66

AROUS SEAST: MINE INSPECTION SAYS.

From The Hill City, S. D., News.

That portion of Mine Inspector Titus Cockillionicided report relating to the Harney Peal; the countries as follows:

The Minist Enterty resident (original to The Toront Paul "I")

"Beard Loquid to The Toront Paul "I")

"Broad Loquid to The Toront Paul "I")

Toronth As a rectived the fellewing speeds of the paul "I was a second paul to the paul to th

#### 5022

#### DOCTOR KOCH'S LYMPH,

THE NEW REMEDY FOR TUBERCULOSIS. THE SECRET OF ITS COMPOSITION-ITS CURA-TIVE PROPERTIES-THE DISCOVERER'S

PAITH UNDIMERSHED. PATTH UNDIVISIONITIES.

Berlin, Jan. 15.—Professor Koll's report, fosued today, as to the lagredients comprising lidjumple, 459 the remeity consists of a glycerine,
extense derived from the pure cultivation of the
tubered healfill. Professor Kosh aya:

"Steen publishing, two months aga, the results
of my experiments with the zow remedy for
tuberculosis, many physicians who received the
preparation have been enabled to bettom no. quainted with its properties through their own experiments. So far as I have been able to reexperiments. So far as I have been able to re-view the statements published and the communi-sations received by letter my indications have been fully and completely confirmed. The gen-bern statement of the confirmed of the con-sistence of the confirmed of the con-sistence of the confirmed of the con-traction of the confirmed of the con-putation processes.

"Heavening the carsile weight the reverse man appear again the shipping the carsile weight the carsile was a season of the carsile weight the carsile was a season of the carsile with the carsile was a season of the carsile was

Appendix to Appendix to the second se

"Functions grown respons the other handof each distinct sufferences," If not, within the
other control of the control of the control
of each distinct sufferences, in fact, within the
the size, and in large the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the control of the control of the control
of the cont

some or action. The arrows of particular particular and the constitution of the more offered and the constitution of the arrows and the constitution of the arrows and the constitution of the arrows and in the dischere gree outly and addedy constitution of the con

"from the nature of a which the specino and specino and the part the specino and the specino a

secondarion secondarion and the contraction of the

Assembly Walkins an Analysis will will see a particular and a particular and a particular and a leading and a particular and a particular and subject of one with how results finally after the subject of one with how results finally after the subject of one with how results finally after the properties of the leading terms of the particular and properties of the particular and the water properties and the particular and properties and the particular and properties and the particular and properties and properties and properties and properties and properties and the particular and properties and properties

OPINIONS OF NEW-YORK PHYSICIANS. IT WOULD BE WELL TO WAIT FOR SOMETHING

NORE DESINITE. Dr. Jacobi was asked last night what he thought about the statements Dr. Kech has just published re-garding his lymph. All he would say was that nothing definite war yet known about the lymph, and the public wenning that yet mouth that yield a too possess worn in allocation read a hurry. He had not yet read Dr. Koch's statements carchilly escaph to express any decided opinions about them, but he felt hat in any case a great deal of time would be required before anothing definite could be known about the new

cemedy.

Dr. A. L. Loomis, when seen about its latest statements in regard to the lymph, sald: "in this
statement that he has just made Dr. Koch
simply states how he arrived at his discovery. He
makes no statement sufficiently definite to enable other to make the lymph. All I can say is that there is nothing definite known about it. It is a subject for ent, and the experiments will take a great deal Dr. Francis P. Kinnicuit said : "In his statement

cut there is a process of the in-the statement of the process of t

St., Lanker, Heights, and I'villi soy that smoot all discontinuous controllers, we see the controllers with the Charlest Controllers with Controllers with the Charlest Controllers with t

The annual export of the Edison Electric Illuminating Co. for the year coded Dac. 31, 1880, shows gross earnings of \$485, 506 and not 1996, 676. The gain in not was \$105,000. The steeker lare steeted the tellowing directors: is R. Bewker, C.

INDIANS AND THE PHONOGRAPH,-At a recent meeting of the National Academy of Sciences, in Boston Mr. Fewkes reproduced on the phonograph some songs he had obtained from Indians, including a war song of the Passamaquoddy tribe in an expedition against the Mohawks, corn dance, rain song, dedication of house song of the Zunis. As each song was ground out from the phonograph it was received with applaus. Mr. Fewkes says he had much difficulty in persuading the Indians to repeat their prayers and sacred rituals in a loud tone of voice, as they had a superstitious dread of the instrument, which they believe to have miraculous

Munua The Keerer Server Dec 11 /190

MR. WESTINGHOUSE HOPEFUL:

TELLING THE PITTSBURGERS OF THE RESULT O' ill a stoccut attention of o' trip hexcess

O' ill a stoccut attention of o' trip hexcess

Philinder, But, I' re-forcess Westinghous, Jr, io
Philinder, But, I' re-forcess Westinghous Benderic
meeting of the conflictor of the Westinghous Benderic
meeting of the conflictor of the Westinghous Benderic
meeting of the conflictor of the service
meeting of the service of the service
meeting of the se OF HIS NEGOTIATIONS IN THIS CITY.

3026 TO MAKE ELECTRIC RATLWAY EQUIPMENT. TO MAKE HASTHUCKALD AT EQUIPMENT.
Albany, Jan Cl.—The Bitchemper-Fold Company,
to do business in Yoshers, was incorporated to-day,
with a capital of \$1,000,000, to simulations and sell
electrical railroad equipment. The trustees are
sames Shethick, Runder Electromyr, Norton P. Oile,
Stophen D. Field, Hectory F. Terredl, Edward A.
Nicholds and Frequete Shither. GILLITAND'S REPLY TO PRISON.

He Says that Kitson was One Hankupt
Sixw and He Helyed Higs Out. 1191
Answers were filed yeardedly by Earls T.
Gilliland and John O. Tomitson in the sult
brought sainfast them in the United States Cirouit Court by Thoms Edicon in May, 1889.
Edition alloyed that Gilliland and Temilisson,

Second Se

Edicion would have been valuelesse for his pur-pose, and also in consideration of Gilliond's pose, and also in consideration of Gilliond's to the new controller. As in inventor to the new controller was a first to the sec-tion like in the controller was a series of the front the compilations, and says he ecoupled on a to hist. Do controller or was several relation as to hist. Do controller or was several relation and the second of the controller of the controller density is usually a corroboration of Gilliand as to the sale of Edicion's according to

Other companion whose animal reports have been controlled to the c

3028

12

ASSESSING THE AIR-SHIP STOCKHOLDERS. ASSESSION THE ATSENTIC STOCKHOLDERS,
Chicago, Jan. 21.—The direction of the Mount Curnel
Archive Company that meeters are successed as assessment 4.1 per
per cent on the 620,000,000 regional assessment 4.1 per
per cent on the 620,000,000 regional assessment 4.1 per
per cent on the 620,000,000 regional assessment 4.1 per
per cent on the 620,000,000 regional assessment 4.1 per
per per cent to the contract of the cents of the cents
and used for construction purposes. The firstfloat months are as the Expectition Building, is bother
assessment as the cents of the cents of the cents
are constructed as the cents of the cents of the cents
are constructed as the cents of the cents of the cents
are constructed as the cents of the cents of the cents
are constructed as the cents of the cents of the cents
are constructed as the cents of the cents of the cents
are constructed as the cents of the cents of the cents
are constructed as the cents
are c

3050

MONEY FOR WESTINGHOUSE,

NY Est Pour LAND. Jan 22 1891 NY Est [htt]. LAND Ja. 22 [891]
Perranuoun, Pa., January 22.—A circular
letter has been received from London, stating
that Gen. Westinghouse has received #200,00
for his sir-brake patents from the London AlyUmake Co. He is also to received acting
10,00 a year to cover any sir-brake inventions he may produce.

tions he may produce.

It is the hope and expectation here that Mr.
Westingbouse will now rescue his electric
company, which is in sad financial strafes.

3031

AN EXPLAINATION, FOR SELLEGE COT.

John D. Chemers, Compiler beausser and the New York
Belling and Twelling Compilers, Strikell theorymoids
and the Compilers of the Compilers of the Compilers
and the Compilers of the Compilers of the Compilers
and the Compilers of the Compilers of the Compilers
and the Compilers of the Compilers of the Compilers
and Compilers of the Compilers
and Compile AN EXPANSION, NOT SELLING OUT.

INCREASE IN BELL TELEPHONE SPOCK: 3032 INCHEASE IS SHILL TELEPHONE STOCK.

Bosico, Jan. 57—Tho Boll Telephone Company has issued a circular to the offect that the company has insued a circular to the offect that the company has increased its coupling steek from \$12,500.000 he git, 600,000, and the number of its shares from \$18,000 to \$15,000. A right intention to each whater of eld steek to subsective for one-either of each steek of the steek steek of the steek steek of the steek steek of the steek ste but subscriptions will be accepted only for full shares. The company will not buy or sell rights. The rights to subscribe will expire Thursday, March 5.

Tubene Son 21 1191

50 3 5 men for 28 Men experience according to the control of the c

50 50 AN RESCRICALLY ILLUMINED WATCH!

AN INCIDENTIAL TELEPRISON PATCHES

FOR THE INCIDENTIAL BETWEEN STATEMENT OF THE PROPERTY OF TH

WY Tribout Jan 28 1891

30 16

AGAINST PUTTING UP POLES AGAIN; AN INJUNCTION MAY STOP THE STRINGING OF

AGAINST FUTTING UP FOLDS AGAINST AGAINST FUTTING UP AGAINST AG

NY. Tribing Jan 28 1801

3037

The Management of Management of the State of

365A

FOUR THOUSAND PASSENUERS DELAYED. A SMASH-UP ON THE HUDSON RIVER ROAD BLOCKS MANY NORTH-BOUND AND

SOUTH-HOUSE PRAINS Poughkeepsie, Jan. 27 (Special).—There was a big smash-up on the Hudson River Railread at Pecks-kill about 4 o'clock this afternoon. The Peckskill work train was crossing the main tracks when a

work titts was enousing the main treats websar as beary fright; train mass shough at full speed and messive limit. Both internatives were lookly described to the contract of the contract of the work of the contract of the contract of the contract the bear the contract of the contract of the theory of the contract of the contract of the 45 for two solver tains involving the Grand Central of the contract of the contract of the contract of the two contracts of the contract of the agreement about 2,660 passengers to book of the confirmation of the contract of the contract of the confirmation of the contract of the cont

the road for three or four hours.

Wreaking trains have been sent to clear up the tracks. Besides the delay of the passenger trains, all through freight trains have been side-tracked till the obstructions at Peckskill are removed. It till the obstructions at Peckslelli are removed. It is a hard matter to obtain fail details, because of the bad condition of the wires. The railrand au-thorities, however, say that no one was burt. The accident is said to have been due to the cagineer of the north-bound freight train mis-taking the signals. The damage to the rollingstock will amount to several thousand dollars.

soft will enseme to accept distincted delitars. Pero December Service to and from the diff on the control of th

M.Y. Trebine Jan 25 1891

3032

EDISON TO KEEP OFF THE SXOW. EDISON TO ARREY OFF THE SKOW.

DAVES, N. Jan. T. (Specials,—Teners, A. CERSAS, IMspeaking to the studgers at the Occle face Miles yeatendy, yeals "Hips, was usuall seet witche saft we
shall have no sense to bother us upon this hill. During
the costing year I shall have telester and suited
to costing year I shall have telester as suited
telestess that will rest the sure as fact as X fairs."

N.Y. Tuking Jan 25 129

Andrew Control of the Control of the

. . . . .

3040

1011

TANK TO THE PROPERTY OF THE PARTY OF THE PAR

This are Normalius to the speech. 20, 8 2 models are proposed to the control of t

18th. Commodities an intermutage season (exi-pose) with greate feedily and all chapter many (exi-tance selfag considered) than in-any other country can the constant of the control of the control of the The interess of Nuthers would and prosperity, largely and to this system of protective to ear heart of the control of the protection of the con-trol of the control of the control of the protection of the control of the control of the protection of the protection of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control o

and upon somes immissed by Mr. Mulinili, the English Mullifelium. In Summiretures we exceeded time ligitain in 1800 by \$1,579,570,191. France by \$5.115. 600,000, and Germany by \$2,000,000. In product of agriculture we excelled (freat firsting by \$5.405. 000,000, France by succession and Germany ligits.) treat littlish cuptored or here to what this this all the to word, of princes, I do not see that this all the to word, of princes, I do not be seen to the word of the princes and allow her and the princes and the princes and the princes are the princes and the princes and the princes are the princes and the princes are the princes and the princes are the princes and the princes are the princes are the princes are the princes and the princes are the princes are the princes are the princes and the princes are the princes a

shed bereiter with room request over here in an about the control of the control

Off these versions are transfer to festelmeraper and of the control of the contro

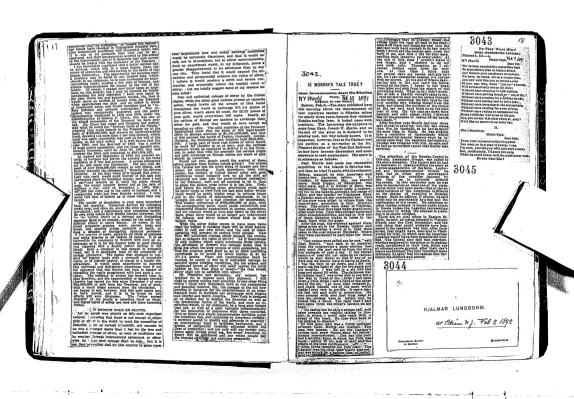
wastrewes.

AND THE CONTROL OF TH

remotion of the law hours as surprade to frequency of the law hours as surprade to frequency of the law hours as the law hours are supported to the law hours and the law hours are law to the law hours and the law hours are law hours and hours and hours are law hours and hours and hours are law hours and hours are law hours and hours and hours and hours are law hours and hours and hours are law hours and hours and hours and hours and hours and hours and hou

Intl. obligations are discoursed, district is created, other hand, offsettlink he residently, price volume for the control of the control of

circulating modium he setured the gravest commercial universities which thereton one influent migrate is model, which is setting the property of the property



# 3047 W Trhine Fully 1891

THE VANDERBILLS BUTING EDISON STOCK. THE VANDEMILIA SECTION BRIDGE STOCK.

Three was a shear lemp is the price of Edition General.

Execute abook as the Sicola Extension yesterday, and a
large stock of the Sicola Extension yesterday, and a
large stock of the Sicola Extension yes the Sicola Extension of the Vandersham of the Vandersham of the Vandersham of the Vandersham of the Sicola Extension of the Sicola Extension of the Vandersham of the "Experience and the second of the second of

led 10 cangas in ser 1927, not the only significance result to that them grati-1928, not the only significance result to the confidence (1) the confidence of the confidence of the confidence (1) the confidence of the confidence of the confidence reply to direct inquiries as to the reports. He did not classife its improvision, beavers, that the Vanderbuller classes in the confidence of the confiden N.Y. Tribuns Feb. y 1891

N.Y. Trebuns Jel 12, 13, 14.

THE SENEY SALE BEGUN.

20:0 --- 1891 OF MASTERPIECES OF ART. DISPOSING OF MASTERPIECES OF ART.

NINETY-NINE PAINTINGS.

NEMPTY-OURSE DAMPENGE.
The make of the foscer collection of plaintings was long to the control of the collection of the

before it, and it was replaced by the exit on the list, and it was replaced by the exit on the land Association.

A large part of the purchases were made in the Association of the land in the land i

colors any red cere are preparing wave segarch, to we may be project of the creation. The state with highest project of the creation.

The salt will be confirmed this securing at the same red to the confirmed and the state of the confirmed and the project of the creation of the confirmed and the profits and the solid. The color latest wave representation of the confirmed and the profits and the solid. The color latest and the solid. The color latest and the solid. The color latest and the solid color latest and the solid color latest and to constrove with the color latest and to constrove with the color latest and the color latest the color latest and the color latest and

"The liaving Road," by Michel; L. Crise Dain "the living Road," or access of the living and living and living the living and living anamed and living and living and living and living and living and l 2003. "A. Caratantinople Market," by Pasini ; E. Naumberg

ells. "The Black Squatt," by Isaboy; James Ross, of Monal, \$175.

"Nos." by Hober; Knoedier & Co., \$150.

"Kening Glow," by Wynat; J. M. Michtenau, \$500,
"The Huntar," by Kakhonse; Fouset & Co., \$110.
"The Nate," by Houghton; Riveder & Co., \$276.
"Blydding the Game," by Hoybet; James Ross, of Men

"The Roburn from the Fields," by Von Pottenkofen;
L. Chie Didinoution, 6215.
"The Old Memon," by Wrent; H. N. Saher, 6215.
"The Old Memon," by Wrent; H. N. Saher, 6215.
"Though Relation at the Intel<sup>®</sup> by Basen Leye; Fronk
L. Thier, of Marieto, Conn., 420.
"Avenum Landscape," by Leitzpo; Dr. Charles Cerrel
"Avenum Landscape," by Leitzpo; Dr. Charles Cerrel

"The Pitherman's Uniteria," of Firstell cannot come; acode, acode

"The Lavisons, of Paris," by Carol, Tunoron Davis, (COC), River Front," by Daubingy; Theodore M., Davis, 45,00.
"The Enters," by Documes; Rucharla Co., 4550.
"The Davisons," by Disk; Bikkedon of Paris, 48,500.
"Astrona," by Dupper, M., Mossing, and Davis, 48,500.
"Morting," by Dupper, M., Mossing, T. T., Creis, 48,500.

antiather's Commission," by Horenden; Warner Var "Goundatar" Commission by Merendan (Warser Van Myco, 4610. P. L. Y. Volum, 1800. P. C. Marchael C. G., 8520. P. Marchael C. G. Marchael C. G., 8520. P. Marchael C. G., 8520. P. Marchael C. G., 852

manto, 4200, "Haking Pampakes," by Israels; Henry Sa "The Water Cart," by Tropon; Blokoslee

\*1.59. "Landstape and Bhorp," by Jeonge; II, N. Blebar #150. Oarrier's Cart," by Caila | Samuel Untergere

, so,uild. Opening in the Weeds," by Dini; George H. , of Philadelphia st are.

"The Genetic Munt," by Frencetin; M. Montaipas, Face, \$4,500, "Spall Read," by Myaner Encoder & Qc., \$1,790,5 "A De Buile" by Heatricks, 4, Louischn, \$240,

"1A Polifier Tand," by Troyca; A. B. Wishner, of Yell. 20 opining, 621,000. "Spermans," by Lecture: M. Mondalgman, of Paris, 7216, "The Watcher," by Roycan; M. Mondalgman, of Paris,

\$100. "Bathing the Herses," by Ruguet; W. S. Ingraham, of ristel, Coun., \$709.
"The Fortheirs Rick," by Vibrit; R. N. Stater, \$4,309.
"Cofting the Leg," by Mauver Kneedler & Ge, \$1,298.
"Making a Train," by Guy; Greeps M. Eikhas, of Pastutcephin, \$1,075. "ibsching," by Lerolle; H. C. Harrison, of Philadelphia,

,050; "The Widow," by Laurens; Russeller & Co., 6500, "Winter Mccolight," by Inness; ex-Judge Horses Res sett #025. "The Mailing of the Fishing Firet," by R. C. Coxe; H.

Hunt Allen, 1r., 400.
"In the Hayleids," by Julien Dupre; William H. Frest, of Trop, \$1,000.

(\* 10g. 8.1.000.

"Nakitting," by Eddichti; F. H. McMahan, 6740.

"The Coming Mist," by Bartel Binkester & Ga. 610.

"The Coming Mist," by Bartel Binkester & Ga. 610.

"Point of Stellar," by Markel Pinkester & Ga. 610.

"Binkester & Ga. 610.

"Markel Arthurster," by Nieder Russelle & Ga. 625.

"Markel Arthurster," by Mister & Bansell Uniteracys,

"Markel & Ga. 625.

91,150.
"On the Scholdt," by Clays; Blakestee & Co., \$500.
"The Dreamer," by Munkacey; Septual Untermer

 "Brening," by B. Briton; J. P. Rian, of Baston, 600.
 "Hoonriso," by Carin; G. P. Biker, 6875.
 "Elswors," by Din; Knoedier & Co., 8550.
 "The Liver Dise," by Daubigray L. Christ Ditmonite, #2,205.
"The Herd," by Tropin; Blakesica & Co., \$750.
"The Pet Spaniel," by Diax; Charles Burand-

enso. "On Market Day," by Dagnan-Beuverot; L. B. Hay,

"The Japanese Reen," by Stovens; H. N. Slater, el,030. "In the Leave," by Threet; M. Montaignee, of Pari

\*\*STA. "The End of the Game," by Sala; Herman Schaus, 43,550.
"The Shepherd," by Tames.

O; the P. A. Bridgman; S. O. Bain, 6-... Puppet Show," by Clairin; John E. Passes "The Pulper State" by Denont-Bretin; H. N. Sister, #1,000.
"The Turing!" by Denont-Bretin; H. N. Sister, #1,000
"Holesting the Night Signal," by Romedi P. H.
McMahan, of Brecking, #755.
"Brittany Washirteenin," by Jules Brecken; M.
Montalgune, of Paris, #5,000.

Jamestanna, G. Tarig, 1,500.

The first for principal gain up were sed of the Million Colons, but No. 100, Castellaneau, and the Million Colons, but No. 100, Castellaneau, and the Million Colons, but No. 100, Castellaneau, and the Million Colons C

Watson B. Dieler

(Igamo, 87000. Virdous "Endournes seconds and control and control

prices pold:

"Whether," by Jacquist, L. D. Haft, 700:

"Whether," by Jacquist, L. D. Haft, 700:

"Excessive," by Wyssit; Herens Schoos, \$410.

"Material Love," by J. Freetj, O. W. Towest, Machester, 410:

"Material Love," by J. Freetja, O. W. Towest, Mathematy, 200:

"Office to Carrelt," by Benjadon, S. Crilles, \$450.

"In the Stoffe," by Charlesset, Jr. Kupether & O. 400.

1,000.
"Heme Dulles," by Isrotls; M. Knoedler & Co., 61,030.
"Bunday Meraing," by Marr; T. N. Finnoy, 9400.
"On the Jetty," by Isabey; George M. McPadden, SIGN. Hilleric Pasture," by Jacque; M. Kneedler &

Co., \$550. "The Coquette," by Knaue; Hernen Schaue, \$2,505. "Tabelly in Chains," by Coultre; William H. Frenz, "Tarkly in Cintas," by Coltest William II. Pest, id.

"Allessence, Nutlimeth," by H. Swan Ollindi,
"On the Sirt," by Vellas; P. A. R. Walters, ed.
"On the Sirt," by Vellas; P. A. R. Walters, ed.
Nutlind, by Courtet; James Ress, of Mostresi,
"Moscilitat," by Tryes; G. L. Freet, 81,050,
"Wellight," by Tryes; G. Th. Freet, 81,050,

a," by Innos: C. Lamburt, 8700. 1 Oak," by Michel; James Hoss, of Mentreal

70. "Sunday Moraing," by Johnson Whittedige; William H. eur, of Trey, 8375. of Troy, 6375. 8 Attack," by Pasini : M. Huteiler & Co., 91,459. cre to the Foll," by Neuve: M. Mentalgnae, of Paris, 62,600.
"Watching and Waiting," by Lerollo; Reichard & Co.,

(edfo., "The First Frest," by Davis; Blakeslee & Co., 6200.
"An Interesting Book," by Edelfeldt, Henry S. Furl "The Pull Mcon," by Conin; P. A. B. Wifener, o

dinicipits, \$1,000.
"A Now-England Landscape," by Wyant; Samuel Unterracys, 2030.

"Still Life," by Vollon; Herran Schaus, 2000.

"Shoep," by Treyon; Rothard & Co., 81,025.

"The First Catch," by Dubbirty; L. Crist Del

,200. "Evening," by Diaz : M. Hacefler & Co., 91,500. "The Brook," by Duper; M. Montaignes, of Paris

at coo. "A. Village on the Oise," by Dunking, J. A. Garland

"November," by Pichicil; D. P. Kellegg, 8750.
"The Last Passenger," by Eddicili; O. N. Crouse, of

"Near Ville d'Avray," by Coret I Hregan Sthatt "The Southed," by Decamps: Bettied, Value "The Wheel Harvest," by Frementin: M. France

"The Wheel Harvier," of research with the Co., \$1,00 Heart with the Co

"Stormy Weather," by Jacquo; James Ross, of Mon-real, 61,250.
"The Buth," by Eastman Johnson; J. A. Hobert, 6750.
"The Sail Reat," by Israels; W. M. Gaylord, 62,000.
"The Still ground," by Dagane-Howvects; L. H. Alexander, \$1,225.
"On the Hill," by Carin; Biskeslee & Co., \$1,050.
"Still Life," by William M. Chase; Herman Behr

medics, \$7,500.
"The Storm," by Troyon; J. G. Green, \$1,025.
"On the River Olse," by Bushipay; M. Knoedler & Co., \$6,000.

a, ec.000.
"In the Channel," by Dupce; E. R. Warren, \$2,425.
"Sultana," by Max; Reichard & Co., \$1,025.
"The Nut Gatherers," by Corol; Charles Burand-Ruel.

83,450. Order of Cord: Charles Durand-Ruel.

"Object." by Inness, James Boas, of Montreal, 8806.

"Object." by Inness, James Boas, of Montreal, 8806.

"Object." by Inness, James Boas, of Montreal, 8806.

"After the Bath," by Feddint: M. Montalgane, of Paris, 82,300.

"Efficient on the Personal Paris States of States, 81,500. ted on the Enemy," by De Neuville: H. N. Sinter, \$1,750. "The Invitation," by Knaus; Samuel P. Avery, In

e1,000. ern from The Pastures," by Troyon; J. S. Gar land, \$7,000 land, 87,000.
"Evening," by Rousseau; M. Michalginae, of Paris, 91,630.
"The Crane Covers," by Daubigny; J. A. Gutland.

"Tulience is a Virtue," by Nicel; D. W. Powers, \$1,650.
"Meditation," by Stevrast S. Collins, \$575.
"Bringing Horre the Fisch," by Levelle; H. N. Stater, 200. "Sentember," by H. Helten Jones; G. W. McFadden,

75. "Virrinia Sunset," by Inness; Watson R. Dickerman

81,000. "Music," by Hebert; Max Bleimann, 2000. "Meening in the Highlands," by A. Bezhour; James Graham, 63,000. "The Mussel Gatheren," by Billot; William Whiting,

"An Art School," by Vibort; Henry T. Chapman, \$2,200. "On the March," by Schreper; A. L. Barber, Washing-"On the Markin, by Gorago, in Kneedler & Co., \$1,000.
"On the Coast," by Storene; M. Kneedler & Co., \$1,000.
"The Philosophite," by Salmann; Hakesloo & Co., \$205.
"Evening," by Art; R. Collint, \$773.
"The Philosophic Days," by Corot; M. Mentalgone, of

Paris, 81,500. "Harrowing," by Troyen; Blatcade & Co., #2,800. "Le Temple de l'Ameur," by Diaz; Boursed, Velet & Co., #2,700.

"The Fregal Neal," by Inness, M. Knoedler & Co. 55,030.
"The Coming Steen," by Inness; Samuel Untermey'r. 61,860. oughts of Better Days," by Knaus : Herman Flett

Syracuse, 6190.
"Hobecon," by Caband; Mr. Wills, 61,000.
"Entrance to the Wood," by Troyen; Samuel Uniteracy, 51,100.

"Old Christian III" by Corst Patchard & Co., 48,750.

"The Washing Frace," by Justicept Mr. Willis, Washing Frace, by Justicept Mr. Willis, Market Market & Co., 48,750.

"Most Village in the Fras & Antiber," by Mr. Missacher, James Graham, 815,000.

"The Steer," by Roytet Mr. Mostler & Co., 43,000.
"The Bran," by Topper Mr. Hosselfer & Co., 43,000.
"The Bran," by Topper Mr. Hosselfer & Co., 43,000.
"The Bran," by Topper Mr. Hosselfer & Co., 43,000.

e3,000. "A Free Storm," by Troyen; M. Honother & Co.,

"After the Storm," by Disa; P. A. H. Wifsten; of
Philadelphia, 84,350.

"Nosidy Tata," by Z'liternitte; Baussed, Valadon

Co., 42,100.

"Comp liters" by Raham. L.

Co., 40,700.
"Come Here!" by Schreyer; Mr. Willis, 4825.
"The Glouning," by Heffner; Samuel P. Avery, Jr., "The Grand Inquisitor," by Laurens; M. Knoedler &

"The Grand Inquisitor," by Laurens, se.

Co. \$1,000.

"The Declaration," by Baron Leys; 'P. A. B.
Wiesser, of Philadelphia, \$2,000.
"La (Organosis," by Alexandre Harrison; Corcoran
Galbery at Washington, \$3,000.

Wilson, of Billiothyla, 2000.

When the Control of the Control of the Control of Control

Polibwing is a list of an use prouves cold last night, with the names of the purchasers and the prices paid:
"St. Thereas," by Max! H. T. Chaptan, \$770.

"M. Morning Call," by Jacque G. Fiatner, 2023.
"Expening at Harbiera," by Wiggins Gorpe Riger,

"The Brave," by Demingo; Samuel P. Avery, jr., \$1,825
"The Brave," by Demingo; Samuel P. Avery, jr., \$1,825
"The Prightened Butler," by Zamecols; Samuel Unite "The Fightenian" by J. F. Murphy; M. Knoedler & Co., 2008,
"Auburn," by J. F. Murphy; M. Knoedler & Co., 2008,
"The Fisherman's Doughter," by Israels; John Not-

A Comment of Charles by Caini J. Foresth Only, 42,755.

"Young Baybon," by Luthows J. M. Hoselite & C., 4750.
"The District of The Charles of C

41,000. "Morelight in Virginia," by Inneas; M. Kneedler & Co., 8340. "The Faircoser," by Jacquet; L. Montaiguac, of Park, 8408. "Always Tell the Truth," by Nicel; Franklin Murphy, "Always Tell the Truth," by Nicel; Franklin Murphy,

"Atleys Zell the Trans," or new transport Thoms:

"The Tension Agent," by Tastian Johnson: Thoms:

"The Chizae, adds." Festival," by Tabley; the Corrects
Galley, of Whathington, 62,55.
"On the Marmy by Paulogy D. K. Bastow, 62,706.
"Marias," by Dauges; T. A. B. Wiferer, of Phillidelphia,
"Marias," by Dauges; T. A. B. Wiferer, of Phillidelphia,

"Marine," by Dopeo; P. A. E. Wittner, of Philisdelph \$1,800. "The Yagget Cleavore," by Dins; E. W. Longich \$1,550.

"The Pages Cleaves," by 20st 15. W. Longillion, "The Target Cleaves," by 20st 15. W. Longillion, "The Page 420s. Clear 15 the States, and Target 420s. Clear 15 the States, and the Clear 15 the States, and the Clear 15 the States, and the Clear 15 the States, and "The Apple Marchael," by 20st 15 the States, and "The Apple Marchael," by 20st 15 the States, and "The Apple Marchael," by 20st 15 the States, and Clear 15 the Clear 15 th

6830. "Night in Flanders," by Carln; William Demuth, "Night in Flanders," by Carin Wilman Demus, 21,760.
"Charity," by Boughtos; Richard & Co., 41,128.
"Cows, by Toryon; Boussed, Valsdon & Co., 44,000.
"The First Miss of the Sin," by Gereme; P. A. B. Widener, or Painted spin, 49,760.
"The Evening Glow," by Incom; W. G. Dominick,

\*\*The Contrabandist," by Schreyer; James Phillips, It. e2,050.
"The Hemeward Path," by Levelle; William Whiting

"The Henrissed same, or heart 1, L. Alice, 81,000, 110,000 and 1, L. Alice, 81,000 and 1, L. Alice,

AND PRINCIPALLY PAINTINGS SALE OF THE HEALY PAINTINGS

,win, the Forest," by Binz; J. J. Brown, \$1,500, "The Fisherman, Mccning," by Corst; I. Monad Paris, \$2,020.

"Meedinght in Heinand," by Cushi; the Orecen Gallery, Washington, September 11, 11 (1997), and the Washington, and the Washing

,500. "At Sea," by Dupre; N. Enzeller & Co., 85.550, "Burnner-time," by Trayon; A. Battlett, 82.850. "The Virgin and the Child," by Disr; J. L.

"The Wallachian Post-Carring," by t Gallery, of Milwaukes, 85,000. "The Child's Funeral," by Knau

00. Mich Pasturage," by Van Marcke; Herren Schul 05. Hubbris Day, "by Isaber; [D. C. Farrer, 94,00

3050

SOME FINE WORKS BY MODERN ARTISTS.

THE SEVENTY PICTURES WERE SOLD FOR \$110,603-THE PRICES PAID.

THE ME AND ACTION PARCED FAILS.

The field that I he sale of the measurifierab description was fished only on fail to the custom was fished only on fail to the custom fail to the custo

readinate for sincely-nine patienting on the first shiptie of the force of the force of the first shipties were the fight were in the whole the least desirable of the collection. The cost pished on also different were cold a filter from the first shipties of the first shipties. The cost pished on also different were for a filter from the first shipties of the first shipties of the first shipties for the first shipties of the first shipt

pumphencar, was started at \$2.000, and family week produced and produced at the produced at th

"Ortober," by Jeruis McEntee: E. Larten. "A Misty Meralog," by James M. Hart and A. P.

"View in Algiers," by Samuel Colman; Preder n, 6110.
"Undeeded," by F. G. Waldmuttler: —, s
"Freit," by Emille Preyer; F. Layton, 6210.
"A Positry Yard," by Lemmans: —, 6310.
"Alternoon on the Hudson," by S. R. Offic.

to Little Trunst," by C. A. Lebi e Spring," by William T. Richar-setim," by J. R. Titten: R. R.

55.

"Landscape," by Bupco; \_\_\_\_, \$525.

"Cattle Resting," by Van Marcko; \_\_\_\_, \$1,700.

"Girl and "Pet," by Blas; \_\_\_\_\_, \$00.

"Miscod, His Lesson," by Moyre von Bromen;

"Moonitee," by Baubigny; —, 40,850.
"The Shepherdees," by Milles; —, 54,608.
"The Truant," by Knaus; M. Knoolfer & Co., &
"Arib' Shepherds," by Pronentin; Herman So

Springtime user Barottes, 500.

3051

BONE GRAFTING AS IT IS.

ACCURATE HISTORY OF THE BOY-AND-DOG EXPERIMENT. NY, Warld \_\_ Dr. Pholps Corrects Sonsational Rumors

About the Operation. SO DOUBT OF ITS REAL VALUE TO THE SOTENCE OF SURGERY.

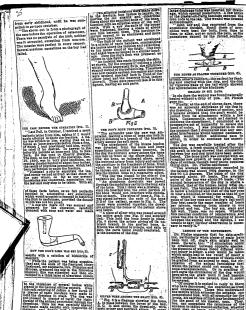
to In Regarded as Practically Certain that Circulation of Blood Was Established Setween the Patient and

the Animal-How This May Affect Scalp Grafting in the Future.

Sende stretting in the Future.
The horsandor hoss-partiting experience of the control of the con



Fig. Placin styr. "As will be sent by the recent ratiols, more of the rate faces and the recent ratio of the rate faces and the rate of the rate faces and the rate of the rat



Dr. Shrady's Opinion.
Dr. Shrady will, say in a aditorial to the Medical Record that the bone-grating experiment has "demonstrated, not only he tissees of different species could be made

3052

ELECTRICITY AND MINING.

IN. These:
IN. The Mining Mining
Into American Company of this city, and
the Manufacturing Company of the city, and
Thomses-Houseld Company, represent or any
age extensively in the manufacture of clebridmining apparents, for which there possibles to
according to the company, represents to
according the company of the content of the
Interest General values a cheer time in the
according to the company of the content of the
Interest General values a cheer time in the
according to the company of the content of the
Virightnam Company is a present energed in authrasito coal fields of Pennsylvanias The Wrightuma Company is at present exagged in the manufacture of electric street-car supplies plication of electricity to mining, it appears to compy a large and profitchly field of succlaims, one of the recoverant streets of the Thomas Hous-ton interests, the other percentatives of the Hy, and Winttop, Collin, Meastr, Lathrop H,

ELECTRICITY AND MINING.

apl 2 1891 Town Topics 3053

3063 TOWN TEACH.

TANY just hich handed me a subscription deplay concerning the sale of \$90,000 of the stack of the fastefor Conduit E Insulation Conduits of the subscription of the subscription of the sale of \$90,000 of the stack of the fastefor Conduit E Insulation Conduits attended to the subscription of the subscription

As within two years the Interior Conduit and Insulation stock was offered as subscription for \$95 a shore, and presumably statisfied for a state price.

The state price, are subscription for \$95 a shore, and presumably statisfied for \$150 a shore presumably state price.

The state price is a state price of the state

As the amount of monthly sales increased it appeared that the costs and general exposess invalidally laterated very law (Probably the nost the foundable that the costs and the costs an

In Eachbit A I note a lot of patents on telephones and transmitter.
It would be well to inquire as to their value, as it is a well-write that any quantity of telephones and transmitter.
It would be the standard to the standard to the standard to the standard to place the standard to place the standard to the standard

THE REAL STORY. A little tree in agreen grow,
And on it were charries, not a few,
And through its limbs the wild winds blee
They blew.

The cherries damed upon the view
Of fittle Georgie W.;
But he couldn't reach them, so high they grew. But he couldn't reach them, so high they They area. So he sot his axe, without more ado. And gave the tree a chop or two. But he saw his pa coming thee, and flow, He flow.

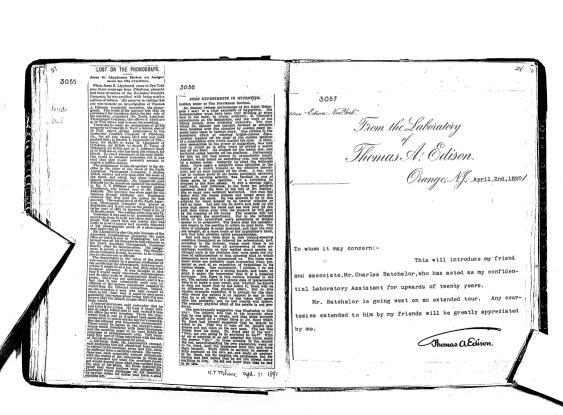
But the populated him back, and he saked him to Explain while he had intended to the, and and if it is disc, his course he'd was.

He'd was.

He'd was.

The passion I abupped it down, boo-hos,"
Back Gorres, "was simply in order to Chains the charries; do you catch, the cast

Note that the charries; do you catch, the cast



ELI WHITNEY AND THE COTTON GIN. HIS SON REPUTES THE ASSESTION THAT THE WIDOW OF GENERAL GUYENE WAS

JIES SON REPUTES THE AMERITATION THAT THE "WINDOW OF CONTRIAL GREEKE WAS

TO US TO CONTRIAL OF A T PAR IN IN A T PAR IN IN IN THE PAR IN IN IN ITS PAR IN IN IN ITS PAR IN IN IN ITS PAR IN IN INTEREST PAR INTER

Hillor May

3059

IMPROVEMENT IN STORING ELECTRICITY.

INFORMERS IN SOUTHON PROPERSIONS.

A new entire bladery which he is these by the region of the state of the second of the second

benching innominio. Another thing in the fixer is the property of the control of

3060

\* CONTEMPT FOR ALUMINIUM.

A CHIPMING WHO DEVICE WHAT IN THE AND OF THE USES IMAGINED FOR IT.

A GHILHERY WHO DESCRIES THAT IT HAS ANY OF THE USE IN ACCOUNT ON IT.

OF THE USE IN LIABILIZED TO HE IT.

SET: It is helvership to which ortake make which is the property of the property of

threaded and detiled without difficulty, white power has been been as a second which is the transport of the play one of the "a second which is the transport of the play one of the "a second which is the transport of the play one of the "a second which is the play of th

in fificen years.

In fificen years.

April 6, 1801.

3061

Marmetle Backs

In a letter to Nature the following instance of extraordinary local magnetic disturbance, due to the presence of magnetic rocks, is cited by Commander Creak : : In September, 1835, when her Majesty's survey-ing vessel Meda was passing Bezout Island, near Cossack, Northwest Australia, a steady deflection of her compass of 30 degrees was observed. This remarkable result has, however, since been exceeded by observations made in the Penguin on November 6, 1890. The Penguin being two miles north, 70 degrees east, from Bezont Island, a deflection of 23 degrees was observed. The ship was immediately anchored, and some hours of the next day were spent investigating the matter. On Bezout Island itself the absolute values of the variation and dip were normal, the dip being 50 degrees 1'7 south. But at a position north 7016 degrees east, distant 3:14 miles from that on Bezont Island, the observed dip on board was 83 degrees south. with a very small deflection of the compass. At 900 feet to the westward of this the dip was normal, and it decreased rapidly as the center was quitted in any direction. At about 100 feet south of the center of disturbance, the compass was deflected 55 degrees. This was the largest deflection observed, but the compass was disturbed over an area of about a square mile. The general depth of water in this area was nine fathoms, and the quality of the bottom quartz sand. The observations of the magnetic elements at Cossacka and the neighborhood showed little or no disturbance from local magnetic effects. It is therefore evident, that the disturbances were due to magnetic minerals at the bottom of the sea.

 $A_{\hat{p}_{j_{j}}}$ 

1100, -- 1000, 1000, 2000

The shear trans stretch water short being \$0,000,000 to the stretch of the shear short for the short for the shear stretch of the shear sh

extensive states are considered to soon their stort to the Meavachille Trest Company which stort to the Meavachille Trest Company which also sand the written authority for the attended of the 40 per ont. The stockholdess are boll in the offensite that that part of the are the company of the company of the stort of t

over an entire the contract of femiliar Table Westingtoner District and Mannichetter and Mannichetter and Mannichetter and Mannichetter and American and Mannichetter and American and Mannichetter and American and Mannichetter and American and Mannichetter and M

mpany last year sold \$4,800,000 worth tel apparatus, and it is expected that it has actively entered the field of treet our motors, the business will

What Is Said in Pittsburg.
Prevaium May b. The Pedears that the
Saffare of the Weslephones Existin Company
have been estimated by the Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears of the
Pedears

### 3064

The total value of the precious metals exported The total varies of the present time approaches from Alaska up to the present time approaches \$1,000,00, the annual production of gold dust and bullion being now \$700,000. Within a radius of 100 miles from Juneau, quartz mills have been estab-. miles from Juneau, quartz mills have been extab-lished, with an aggregate capacity of 600 stamps. Of these, 20 atamps are employed at the well-known Treadwell or Paris mine, on Douglas Island, capa-ble of roducing 600 tons of ore per diem when both steam and water power are utilized. There are said steam and water power are utilized. There are said to be extensive deposits of copper in the territory, but the difficulty of transportation has hitherto pre-vented its development. Lignite coal of superior quality is also found in various places, but is missed at only one point. Granton M. J. OK 4. 1791

### The May 24

### 3065

AT SOUR OVER INCANDESCENT LAMPS. AT SOUR-OVER INCANDESCENT ALAPPA.

The suit of the Educa Relective Taght, Company against the United States. Electric Lighting Company will be pried before Judge Wallace at the session of the United States Creat Court in this city beginning to-according to the Company of the States Court of the Company of the States Court of the Company of the States of the States

Involves what Mr. Edison asserts was the fundamental involves making to incandescent lighting which made this mathed commercially practicable. The argument before Judge Wallete will probably begin to-morrow and will eccupy towns days.

#### Edisonia 3066

The Albert medal of the Society of Aria, of London, has been awarded to Thomas A. 205. London, has been awarded to Thomas A. 205. London, has been awarded to Thomas A. 205. London Lond

3064

May

13

New!

30

A GREAT ELECTRICIAN.

PROFESSOR HERTZ AND HIS WORK AT BONN. PROFESSOR HERRY AND HIS WORK AT BONN.
Bonn.an-Albein, May 6: It may 6 the readers of The Tribune had been on the Ribne in. the first, outside 7 the restorage of the tribune had been on the Ribne in. the first, outside 7 the tribune had been constant, readers of 17 for Tribune do date from away back—they would, remember the building way been—they would, remember the building way been—they would, remember the building women fifty years thereafted (1717) these man fifty years thereafted (1717) the man first years thereafted (1717) the building way for the first years of the rebuilding is defined and the first first had been and the present the first probability to the following the first first probability is glount and the fully restored whose some fifty years themselve (1777) it was marillay destroyed by fifty. Just now the last of the destroyed by fifty. Just now the last of the destroyed by fifty. Just now the last of the destroyed by fifty of the last of the

And yet in both German and English labora-tories electricity is studied, as it always has been

tories electricity is studied, as is always has been with great interest and greater results.

The enough to which I have referred is the dis-covery of electrical waves, which behave very much as light and heat waves do; and can be put through all the paces of reflection; refraction,

much as light and bast, wave day, and can be interference, either and the libe, by methods well interference calls and the libe, by methods well understand by everybody at all amiliar with sound for the liberary of the lib symmatism he did not form the usual habit of co-cessive beer derinking, which countes the most of the thought and vitality of from cishty to hinety the count of the Gorman university students (the

He is a splendid example of the three necessary elements to success, insuite ability, hard, world, fortuitous, circumstances. His present attention is unusually invariable for work, making in the properties of the control of the co

ling of a pracedual weaking hierarchy; ling of a pracedual weaking hierarchy; from any one of swhols; from our desired attent some, from any one of swhols; line was stated attent some, from any one of swhols; line weaking and the line of the swhols; line of the swho

The experiments of the protected to full Vision potentials are to the protected with the

Dietr-a method for producing them Occiried, the object of the control of the object of

3068

GENERAL ELECTRIC COMPANY.



COL, FRANK K. HAIN. Photo, Pach Bros.

Edismia -

3070

hlay 1892.

A REGE ELECTRIC CONFORLISTON

CONSIDERATION FOR THE TOTAL CONFORLISTON

CONFORMATION THE TOTAL CONFORLISTON

TO A CAPTAR TOTAL CONFORLISTON

A PROPERTY HOUSE OF SECURITY CONFORLISTON

A PROPERTY HOUSE PROPERTY OF SECURITY CONFORLISTON

A PROPERTY HOUSE OF SECURITY CONFORLISTON

A PROPERTY HOUSE OF SECURITY CONFORLISTON

A REAL PROPERTY HOUSE OF SECURITY CONFORMATION

TO PROPERTY HOUSE ORDINARY OF SECURITY CONFORMATION

TO PROPERTY HOUSE OF SECURITY HOUSE OF SECURITY CONFORMATION

TO PROPERTY HOUSE OF SECURITY HOUSE OF SECURITY CONFORMATION

TO PROPERTY HOUSE OF SECURITY HOUSE OF SECURITY CONFORMATION

TO PROPERTY HOUSE OF SECURITY HOUSE OF SECU

Micros Services Security basing after the Silven-ticents.

An advantage of the Silven Services Analyses order to the Silven Services Services Services Services Services Services to a accomplished to the new company. Herefular is a accomplished to the new company the Silven Services Service

STEAMERS IN COLLISION IN A GALE. A CHIEF ENGINEER KILLED-THE ENGINE WO

SANVILLAM VS. EDBOY,

BANVILLAM VS. EDBOY,

The Gunselland Electric Life a fungament
In Gunselland Electric Life a Gunsely in
the Street of the theorem Most please. Takes patient
to the street of the theorem Most please. Takes patient
to the street of the theorem Most please. Takes patient
to the street of the theorem Most please. Takes patient
to the street of th



SECRETARY CHARLES FOSTER.

3078

FIRE BREAK PRESENTION PAIRWITH.

FIREMA, Special Deposits A make you not proved that the position for the ball temporary of the pairwine p THE BELL THEEPHONE PATENTS.

Heraid MURAT HALSTEAD.

5046

KY Acraed May 15 1892

3079







AMERICAN INVENTORS' RIGHTS. THE RELATIONS OF AMERICAN AND FOR-3080 EIGN PATENTS DETERMINED.

scription was neglectary granted, or whether its shoots are employed to the possible extension of the section of the section of the possible extension of the section of th

3081



Rev. of Review June 1872



3083



THE MIRACLES AT LOURDES.

- 1892 A PAITHFUL CATHOLIC NARRATIFE OF

THE APPEARANCES. N.Y. Sun - Noy 29

for Laborers Buring Showers a Beautiful Figure Was Setu by a Pensant Girt-Her Story Was Not Belleved at Piret. but in Time Crowds Assembled When the Prayed at the Entrance-Starties a Stream That Has Plowed Ever States Wonderful Cures Recorded-Pilgrimages from All Parts of the World-Thorough Investigations Which Prove the Reality of the Miracles Witnessod There.

of the Miracise Vitteesses There.
This narristics of the dichien expensations of the bloom of the dichien properties of the bloom of th

remediate formalisment, we war note must be able with and family by the deliver. He had will and family by the deliver. He had will and family by the deliver. He had will and family by the deliver. He had the second of the sec

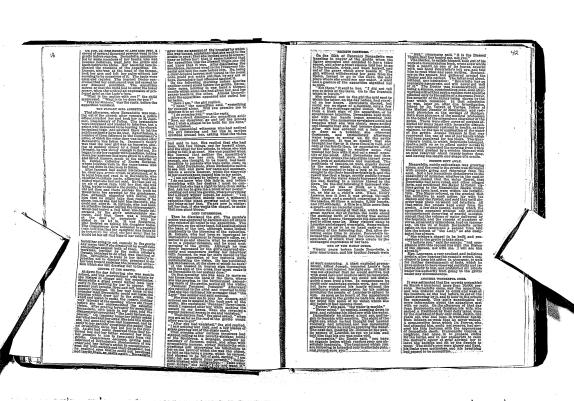
"Begins, with grave that "article "contine, musc-the sign of the cross, and Bornalette, who by this tilms had come to her season, tild the thint tilms had come to her season, tild the same. After rubbing her eyes to make sure she was not dreaming, his began to recibe the fire decides of the recarry which took a quarter of an hour, and after he had utbreed the last" (flory be the Pather, Son, and the 1007 (Boats' the figure disappeared.

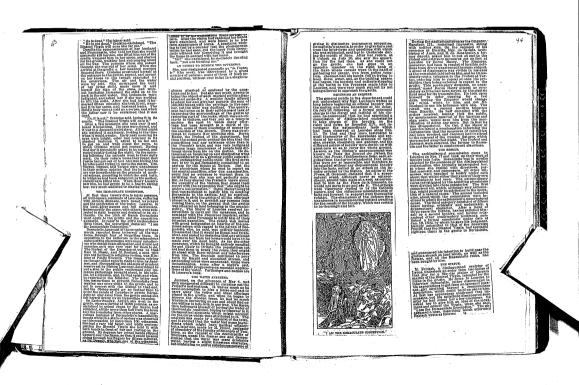
the sist "Ober" is to the Nather, the, as the sist of the Nather than a side of the Nather than

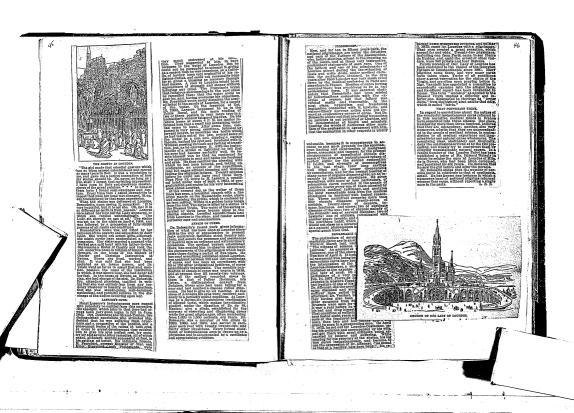
moments' prayer, one of the party who had brought a pint bottle filled it with holy water, and, as they had their fears about he believes of the source of the appartites, they asked Bernaddete to promite to use the holy water. On arriving at the greate they observed that its appearance had not changed, although an expressing the property of the control of the cont Lot us pray," suggested Bernadette, "and precise the resary."

the costatio change in Bernaldtte's features.

There she is," she exclaimed, "and she begkens me to draw narro," when," her two results of the plainty when," her two results of the plainty when, we will be comes here. In she a soul from purgatory imploring to have masses offered for her begken to the write her which so no this paper."







A Cure at Lourdes.

ERNEST RENAM.

BRYSHT HEVALY.

Proteines or the Berty Line of the Great
Flam, May 24. Decode, Siene in administrative of the Line of the Great
Flam, May 24. Decode Siene in a definition of the Control of the Control

ROW. D. Per. ERNEST BENAN. June 1892



Per of Brax O'BELL . UNE 1892

Passenger-List.

# S. S. "Meptun". Bergen to Morth-Cape

22th-30th July 1892.

Ouptain: Hr. J. N. B. FOLKEDAL. First Officer: A. PAULSEN. Second Officer: P. T. CAPPELEN. Restaurateur: TH. OLSEN.

Hr. Professor Dr. Ipsen. Kjobenhavn Hr. Generalkonsul Holmblad. do.

Mr. A. London Snowden, Envoy Extraordinary and Minister Ptenipotentiary of U. S. A.

Mrs. A. London Snowden. Athen. Hr. Advokat Max Levi. Mainz am Rhein.

Hr. Grosserer H. Mashach. -Mrs. H. B. Morhead.

Miss A. H. Monfort. Miss M. M. Monfort.

Cincinnati Ohio, U. S. A.

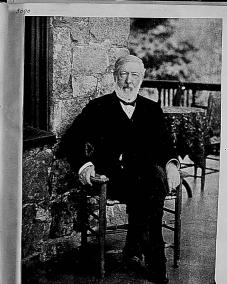
Hr. Ch. Aug. Moppert, professeur de français (Ecole

Mochmann). Dresden. Hr. H. Goetze, Premierlieutnant. Dresden.

Hr. Baron von Lilien. Berlin.

Hr. von Tiedemann, Premierlieutnant. Berlin.

Hr. Dr. Koch med Frue. Berlin.



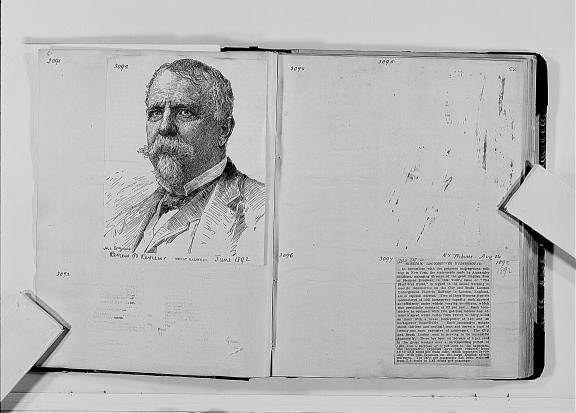
Persen of Review HON. JAMES G. BLAINE, SECRETARY OF STATE THE 1892

A

Hr. Dr. S. Küstner. Leipzig. Hr. Dr. H. Kittembull. do. Hr. Rentier A. Duval med Frue og Born. Paris. Hr. Rentier R. Manot med Frue. Marseilles. He Rentier Bairon med Frue Miss Mason. Virginia, U. S. A. Miss Carroll, Maruland, -Miss O'Donell do. Mdm. General Arion. Mull. Zoé Arion. Bucharest, Rumanien. Mull. Marquerite Arion. Mr. Rentier A. Batcheler, Mrs. A. Batcheler, New York, U. S. A. Miss Emma Butcheler. Miss Rosa Bulcheler. Mr. Rentier Alfred Davis. Dallas. U. S. A. Mrs. Alfred Davis. Mr. Banker J. C. O'Conner, Doctour Jean Louis Faure, Mdll, Jean Louis Poure. Mll. Bourgois. Mll. Sauregis, Hr. Justitsraad Ornold. Fraken Klara Ornold. Fraken Mararethe Ornold. Madame Van Nuffel, Britssel Froken Van Nuffel. Hr. Dr. L. Dronin. Paris. Hr. Marcel Dronin. do Hr. Dr. jur. Zaffé. Berlin. Hr. Rentier Baland. Fru Sneider. Dresilen. Froken Sneider.

II. Polivition B. Back. Kurlaruba.
Polavition Vierner. Kristinia.
Polavition Vierner. Kristinia.
Polavition Vierner. Ko.
Polavition Vierner.
Polavitional.
Polavition Vierner.
Polavitional.
Polavition.
Polavitional.
Polavition.
Pol

Troman O. Kjeldeetha Begir. - 18



119201

Fel 10

X TO BE FROZEN OUT Feb IT IS RUMORED THAT IS TO BE EDISON'S FATE.

The Editon General Electric Company Said to Have Been Practically Swallowed up, by the Thomson-Houston People-How It Will Affect Edison

and His Companies.
"Thomas A. Editon is being frezen out of great interests of his own creation," says this morning's New York Recorder, "The Edison General Ricetric company

was organized three years ago by Henry Villard to consolidate the Edison electric lighting and power companies. A plan has been perfected whereby a rival concern, the Houston-Thomson Exectric company, will awallow up the Edisor General The Edison General stock is to beincressed to \$50,000,000. Of this amoun the present holders will receive in exchang for their shares \$15,000,000, while the son-Houston shareholders will receive \$18,400,000. The balance, \$15,600,000, will 'remain in the treasury, subject to disposition, of course, by the majority, which ans the Thomson-Houston.

INVARIONESS OF THE PUR. "The deal, from all that can be learned was carried out without the concurrence of Mr. Edison. He has been opposed to it, and will, it is understood, retire from the board of directors. The combination of the two electric companies was effected by Mr. Villard, who has been president of the edison General since its formation.

There was a conference the other day,

the facts of which leaked out yesterday, in which the participants were Mr. Edison, Mr. Villard and Samuel Insuli, the vicepresident and practically the general m ager of the Edison General. 'It is an outrage that the Edison General

should have been put into the hands of the Thomson Hobston;" said Mr. Insuit to Mr. Villard.

for your miscoamsgement," said Mr. Villard to Mr. Insull, in tones soveral degrees below

Error.

"Directly hange the tab. Mr. result has tong boop the right-hand must be the Dilays it is begintered believed. Mr. Gilmen's the pointries limiting.

Mr. Erliem's agent in London. Her design asking poly bardners qualitate that Mr. Erliem's remumened his to Alterna and Interested to Mr. In the management of some of this barder. In the contract of the contrac

"When the Editon General, the great controlling corporation was organized, Mr. Insult was put in as vice president to represent Mr. Edison and to, in reality, su pervise its operations. Mr. Edison is reported to have had his eyes opened by ireent events which have turned out so unfavorable to himself. Now, from all soounts, he is disposed to blame Mr. Insuli for not looking more closely after his inter ests. Mr. Insult is said to have acquired a large interest in the Edison General and its allied corporations. Nevertheless, if the and give way as general manager to E A in, vice-president of the Thomson-Houston. Mr. Villard is to be succeded as president of the Edison General by Hamilton McK. Twombly, who is one of the heaviest stockholders in the Thomson

WHAT THE "WORLD" SAYS "The deal between the Edison and the Thomson-Houston Electric companies has nomed exact unpleasant feeling. The Edison rest practically gobbled up by the other concern, and Mr. Edison himself is reported as being very wroth at the slipping away of his interests in olectrical holdi

"In 1880 when the Edison General c pany was formed Mr. Editon unt obief stockholder in the Edison Electric Light ompany, also in the Bergman & Co. firm ture makers also in the Edison Machine works at Schenectarly, also in the Edison Lamp company of Harrison, N. J.; and he was a large holder in the Sprague Bleetrie Rallway and Motor company. There were all dumped together into the Edison Genera. company, and now this has been taken into the capacions name of the Thomson-Hous ton company and at the end Mr. Edison finds bimself with a dissinutive interest of about 10 per cent, it is reported, where formerly his word was law and his control supreme. At a recent meeting of President Yillard, Second Vice President Samuel J. Insuli, of the new concern, and Mr. Ediron some sharp talk was indulged in. Mr. turned upon him with a sharp "If it had not been for you, Insult, this more would not have been necessary."

"Insuli was once a sprolal pet of Editon. who thought he was a model financial managor. He represented Edison in England, came here and took charge of the Schenecshop, was often at the Pitth avenue office and also at the Wall street offices. He got shead all the time, and is now practical manager of the consolidation; but in the near future E. A. Coffin, of the Thomson Houston company, will take the name and dulies of general mapager.

There is much orimination and rectimination going on, and it is a question whether Educon will remain in the directory of the united companies. Insuli is blamed for much of the stock manipulation and mani pulation and management which resulted in the Edison people finding out one day that J. Pierpont Morgan and his brokers had been picking up Edison stock until they were prepared to dictate the amalgamation and, when Villard goes out in a month or more, to piace a Yanderbilt man at the head of their electric monopoly MR. EDISON'S INTEREST, 9

"Mr. Edison's holdings in the Edison General Company are stated to be about 10 per cent. Therefore he has little voice in its affairs on a vote. He was the princi pal owner in the companies which made up the Edison General, fint the process of "in erossing" the stock put him in a very diminutive minority. He was the chies stockholder in the Edison Lighting Company, holding over 50 per cent. of the stock of Bergmann & Co., electrical manufa ers in Avenue B: over 50 per cont. of the stock of the Edison Machine Works, at Schenestady; over|50|per cent. of the stock of the Edison Lamp Company, at Harrison N. J., and he had a heavy interest in the Spragno Electric Motor Company, THE TWO BIYAL COMPANIES.

"The Edison Lighting companies have paid most attention to juneandescent and isolated lighting, while the Thomson-Houston has devoted itself principally to the lighting of towns, cities and establishments by are lights. Rech. however, was working into the others field. The consolidation of the two companies is now going on by, an exchange of stock.

There is a report that Mr. Edison will

organize an opposition company, THE STORES DESIED.

that Mr. Edison is to be frozen out and the we are to be absorbed by the 'Thomson Houston people," said Mr. Gilmore, the sections manager, this morning, after a Union reporter had briefly told the story given above, "and I don't believe them continued Mr. Gilmore. "There will- be no absorption by the consolidation of the Rouston are the leading companies in the electrical business, and by this consolidation we will be able to keep prices up, and that's why the two companies decided to combine a. The combination will not affect the works of either company, they will both continue to run as they have in the past. The plantin this city will not be effected one way or the other "

TRelative to the story that Mr. Edison and Mr. Insull had had a fallen out, and that the former was to be frozen out, Mr. Gilmore said he believed it to be all bosh, and the creation of an irresponsible imaginative mind. "When they say Mr. Edison has Saly ten per cent of the stock, they don't know what they are talking about," Mr. Gilmore. "I don't believe that Mr. Intuil and Mr. Edsson are at sword's points; quite to the contrary I believe them to be the warmest kind of friends."

"Do these big buildings full of busy men look is if there was much mis ment" seked Superintendent Turner, when questioned about the stories. "We are increasing our working force every day and are shipping and continually receiving hig orders. That would not be the case if there was much mismanagement. I don't believe there is anything in the stories," conclinded Mr. Torner

Bradford Ill. Weekey Mah 41893 The Patience of Inventors, 7

3099 "Won't you tell me about the first carbon lamp you "Won't you call me about the first carbon lamp' you ever made "I said to Editon.

"Ah, that is a story. The carbon of the first lamp was made of a spool of Clarks' thread. "All night Eatheller, my assistant—the greatest and best of my assistants, the man of infinite, patience and

assuments, the man of infinite, nationers and indictalguishe previousness and the same and a mindetalguishe previousness and an account of the natural systems and a superior of the same and a same and a superior of the same and a superior of the "Markow man and a superior of the same and a superior of "Markow man and a superior of the same and a superior of "Markow man and a superior of the same and a superior of "Markow man and a superior of the same and a superior of "Markow man and a superior of the same and a superior of "Markow man and a superior of the same and a superior of Markow man and a superior of the same and a superior of the plant blower's not believe the same and a superior of the plant blower's not believe the same and a superior of the same and a same "Same and a same "Same and a same "Same and a same "Same and a same "Same and a same a

we reached the glass-blower's bench, the wreched carbon broke.

"latefulfer turned round and looked at me, and at the recollection glasses, the period one." I have been been also been al

In its said.

"That was one of Batchellor's pergetain because, which he had said to me a hundred times before, and which I had said to lime. We turned back to the meal belocatory, and set to work again.

Independent, and set to work again.

Independent, and the said of the said of the said of the decident of the said hald in down, whom a juvellers assuredriver—a very little stamin, any above—celled down and basis in the stamin of the party and the stamin of the party of the stamin of the party of the

ME I

that Thomas A. Edison, the celebrated electrician, is dissatisfied with the projected consolidation of the Edison Gene al Electric consolidation of the Edition Gene al Siceriol company and the Thomson Houston Co., and that he will retire, if, indeed, he be prote prentically frozon cut. It is said that he will service company, which controls the company one-tenth of the Edition General Electric company, which controls nearly all his patents, and with that small proportion of the whole stock in practically, powerless. The fact that he has always and the control of the tell only a comparatively small amount of stock is interesting of itself as showing steek is interesting of Itself as showing that Edison is sharing the fate of Invent-ors generialy. Other men have the ma-jority of the stock and are drawing the dividends.

dividuals, "come and unawing the When the company was formed in May," 1880, Ridson had a controlling interest, in the Editon Ricerto faght company and in the Birgman company, manufactures of cetteria supplies; also re-controlling interest, in the Editon Machine company, of the Editon Marchine Company, and the Was Companies are absorbed in the Sprague Ricertic Company and by the General Execution Companies are absorbed by the Companies and the Companies are absorbed by the Companies are absorbed tric company, and it has nover been known how Mr. Edison lost such a large on lost such a large propo

for a number of reas.

The consolidation deal with the Thomson-Instance company, from all that can be feared, was carried on all that can be feared, was carried on the learned, was carried and will, it is understood, relief to the stand will, it is understood, relief to the stand will, it is understood to the stand with the standard of the standard

There was a conference flip other day, in which the participants were Mr. Edlson, Mr. Villard and Samuel Insult the year-president and practically the general manager of the Edlson General. 3100

Chund

dar

general manager of the Edison General, "It is an outrage that the Edison General, "It is an outrage that the Edison General aheald have been put finite the hands of the "Rhomson-Houston," said Mr. Insulito Mr. Villard, "It would never have happened except for your mismaning mont," said Mr. Villard to Mr. Insuli, in tones several degrees before zero.

tones several degrees befor zero.

Thereby hange the tale. Mr. Insul!
has long been the right-hand man of
Mr. Edison in the "electrical business,"
ille was Mr. Edison's agont in London,
He showed bash good business qualifies
that 'Mr. Edison summoned 'bin to elAmerica and intrusted to him the management of some of his business. ment of some of his heaviest interests, c-When the Edison Geoscial, the great controlling corporation was organized, insul was put in as vice-prosident to represent Mr. Edison and to, in reality, represent Mr. Edison as to, in reality, represent the properties of the

its allied corporations. Nevertheless, if the story is true, he must "walk the plank" and give way as general manager to E. A. Coffin, vice-president of the Thomson-Houston. Mr. Villard is to be a superiorated to the company of the Police. Succeeded as president of the Edison succeeded as president of the Edison General by Hamilton McK. Trombly, who is one of the heaviest stockholders in the Thomson-Houston.

Mr. Edison's holdings in the Edison Mr. Kölsen't holdings in the Edinost General company are stated to be about 10 per out. Therefore he has little voice to the control of the c pany.

By he terms which have been arranged

By he terms which have been arranged the total capital stock of the Edison com-jany will be exchanged for \$15,000,000 capital stock in the new company, while the empiral stock of the Thornson-Houston the enptial stock of the Thomson-Houston company will be exchanged for \$18,400,000 in the new company. That will give the Thomson-Houston people the advantage, and as their elec-trician, Professor Elliu-Thomson, is con-sidered an company telestiat, it is profit-uable that the will be made the other close. able that he will be made the shier elec-triciant of the new company. It is "ban-lieved by some that this lattice con-of,"Mr. Zelloon's dissatisfaction," or 'ban-yould not wish to we's most of consistency in take, the place which by threating pages.

A director of the Edison company said yesterday: "It is not true that Edison will be thrown out of the directory of the now company. On the contrary, every effort will be made to induce him to take the position. The only trouble we anticipate is to get him to take the place."

Mr. Edison's patents are nearly all or trolled by the Edison General interest and start a new man be necessary to confine its bis. new putents as Mr. Ediso

leagues might get.

1900 16 TROYON, CONSTANT-The Old Oak. Early Antumo.

17 DIAZ, N. de la PENA-A Bouquet of Flowers. 18 FROMENTIN, EUGENE-Horse Trading in the 2566 Desert. 1075 19 DUPRE, JULES-Fishing boat in a Storm. 150 20 BOLDINI, G.—Boucher in his Studio.

21 ROUSSEAU, THEODORE-The Plains of Barbi-1850 CANO 22 DIAZ, N. de la PENA-Capid's Lesson. 23 KNAUS, Prof. LUDWIG—Head of a Brunette. 3 5 0 24 MILLET, JEAN FRANCOIS-Peasant Woman 25 DAUBIGNY, CHARLES FRANCOIS-A Late

Summer Afternoon. 15.00 26 DIAZ, N. de la PENA-Page and Hounds. 3500 27 FROMENTIN, EUGENE—A Boar Hunt. 5 DOU 28 ROUSSEAU, THEODORE—A Cottage at Berri. 1160 29 DIAZ, N. de la PENA-After Rain-Sundown. 110 30 DUPRE, JULES-Sunset in Autumn.

1750 31 ROUSSEAU, THEODORE—The Rabines of Apre-1 DO 32 DIAZ, N. de la PENA-A Siesta.

0 600 33 DELAGROIX, EUGENE—Christ at the Tomb.

U W O 34 COROT, JEAN BAPTIST CAMILLE-Morning.

35 DECAMPS, ALEXANDRE-GABRIEL-Turkish Butcher Shop. 36 DIAZ, N. de la PENA-Landscape-Under Shadow. Z 5 0 37 DUPRE, JULES—Cottage at L'Isle Adam.

38 FROMENTIN, EUGENE-The Fire. 10 30 DIAZ, N. de la PENA-In the Woods. 40 MILLET, JEAN FRANCOIS—Diana Reposing. 250 41 ROUSSEAU, THEODORE-Sunset in a wood.

Q 20 (14 MEISSONIER, J. L. E.—A Standard Bearer of the Flemish Civil Guard. (150 48 DIAZ, N. de la PENA—Above the Clouds 44 MILLET, JEAN FRANCOIS-A Shepherdess,

45 DIAZ, N. de la PENA-The Assumption of the (a) 00 46 ROUSSEAU, THEODORE—An Autumn Evening. (4 TO AT MILLET, JEAN FRANCOIS—Gleaners, O 4 18 DIAZ, N de la DESC.

-49 DOMINGO, G .- Card Players. UCER 50 KNAUS, Prof. LUDWIG-Le Saint des Amours. 1557 51 DIAZ, N. de la PENA-Scene from the " Decam-

eron." X S O U 52 MEISSONIER, J. L. E.-A Musician. 53 DELACROIX, EUGENE—A Tigor quenching his Thirst.

2.50 b 54 MILLET, JEAN FRANCOIS-Sleeping Woman. 44100 55 DIAZ. N. de la PENA-Passing Storm. 5500 56 TROYON, CONSTANT-A Cloud Burst.

1051 57 KNAUS, Prof. LUDWIG-Drove of Swine-Even-73 10 68 ROUSSEAU, THEODORE—Sunset.

7000 50 COROT, JEAN BAPTISTE CAMILLE-A Far 8 50 60 DAUBIGNY, CHARLES FRANCOIS-Midsur

mer-Edge of a Pond. 65 61 FROMENTIN, EUGENE-Amb Falconer. 62 ISABEY, L. G. E.—A Fete at the Hotel Rambol

illet, Paris. 26000 63 TROYON, CONSTANT—Drove of Cattle an Sheep.

64 DIAZ, N. de la PENA—A Clearing in the Forest Fontainebleau. (1) 65 FROMENTIN, EUGENE—Women of the Oule

Nayls, Salara.

Nayls, Salara.

Government of the Serpent Charmer. 50 00 67 SCHREYER, ADOLPHE—The Advance Guard. 68 BRETON, JULES-" Le Soir." 200

ORTGIES & CO. Auctioneers.

# Hanceline Painstooker

### THOS. A. EDISON IN TOWN.

A Very Interesting Conversation Held west When Land Premiur. Thomas A. Edison the "Wizard of Menio Park," as he is familiarly called, accompanied by Charles Batchelor, of Orange, New Jersey, ar-

stein Fark," as he is femiliarly facilities, and the second of the secon

statement to the control of the cont

He jess well seguentee; with 'mey late Arlo Parise, he said, and had well as the said of the late while he lived, in the had well as the late of the late of the Arlo Parise of the Arlo Parise of the late of the la

3103

June 3

1892.



3104

Another question is, whether we will attented the National currency that is now in discussions ambog in, consisting of Treesury nodes and Xalmond Banks nodes and gold and silver certificates, all of uniform value throughout the civilized word, and equal to the best pold coin over lossed at any mint, or whether the contract of the co

THREE GREAT ISSUES

The state of the s These three questions, my fellow-clitzens, are the ones that are at issue between these two great parties.

for the heseth of a raw,

THE COMPUTION AND PROPROTECTION

THE COMPUTION AND PROPROTECTION AND PROPROTECT

and whother co. not the

In which had been a second to the second to Senator Sherman apoles as an expense;

defined an area of sentence I congrued to a select of several or at a congrue of the series, that at least of the series of the ser

Various control would be grown to controlled to the controlled to

where "Section" is a "Section" and "Section"

N.Y. Tuhine previous & Mov 4 1892

will know, the substring uses. He don't know whenes the first screen speed one question. He still sare, he seems to be supposed on question. He still sare, he shall be supposed on the seems to be supposed on the seems to be substrined (Article of Sec. And to this propiet propiet, Corne of Sec. And to this propiet propiet, Corne of Sec. And to the substrine of t every part of the United States, and three, whose the ordinary resolution which had been subject in a phenocratic convention was offered in favor of semo-bland of prescited, they holdly struct that out and large production of the state of the state of the all protective duttes were noted favor made all upon the hadron man, and for the bounds of a few. New I want our Phenocratic trients, as they have made this bests, to state up to the rate, I've in not often the state, to state up to the rate. I've has not ever. (Lasphter) John they do they have the been passed to the state of the state of the state of the last passed to the state of the state of the state of the last passed to the state of the state of the state of the last passed the state of the state of the state of the state of the last passed the state of the state of

ever. (Laughter.) And now they should stand up to it. their melant stanet up to 10.

The state of WHAT IS GOOD ABOUT IT. 2

which here could not have been descripted—captured and the transport of the property of the National State of the Part of the

The second of th

the higher of the factly policy. (Applicate)

FARS OCCUPIETORY SETTING ANY STREET IN SETTING IN SETING IN SETTING IN SETING IN SETTING IN SETING IN SETTING IN SETTIN

Now my fallow-titted out that it out the fall of the Protection. The theory of this destrine, I have our pounded to you and to it as simple of any other recognition in white composition, the who was the protection in which composition is considered to a simple of any other recognition in which composition is considered to a simple of any other including the considered to the considered that the considered that the considered the consider THE DANGER THAT THREATENS,

My coupleymen, reverse this policy. Do what our Democratic freeds say they injend to do. Reyest this protective laws. Bring the laboring main dugen to the hard and close competition with independent England and Ireland, and Scothind, in Germany and | England and Treland, and Socialist. In Gerillary and in Prance, and all the countries of Planges, is, that in Prance, and all the countries of Planges, is, that in Prance, and all the countries of the people! Do they, want to break fewir their industries now scarred in the recel And yet, countrymes, if this Democratic-paties is adopted that in countrymes, if this Democratic-paties is adopted that in the property of the prope

princes, the sharp of plane households, made with the plane of the pla

The state of the s WHERE THE DUTY 15.

Assister these. Our Demonstrib Steads and Only and the Company of the Company of

CASSESS OF PRINCEPARABILES.

I does layer amplied that is interested in Free Track except three dieses. The first them is the Track except three dieses. The first them is the Interest of the

have not yet got over their troubs about the war; who would like to go track and fight these bottless and the state of the

THE CHAPPEN CURRENCY. Lawrence of the control of th

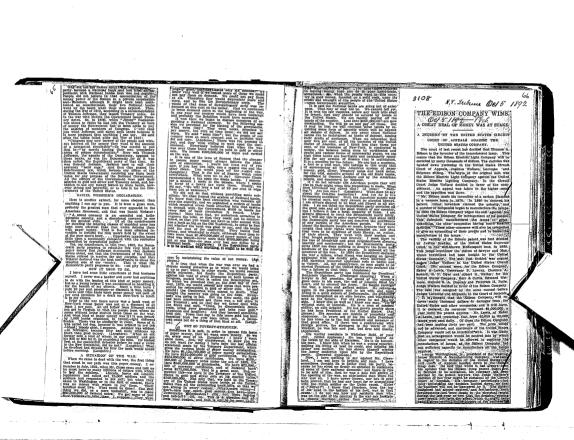
The president of the pr

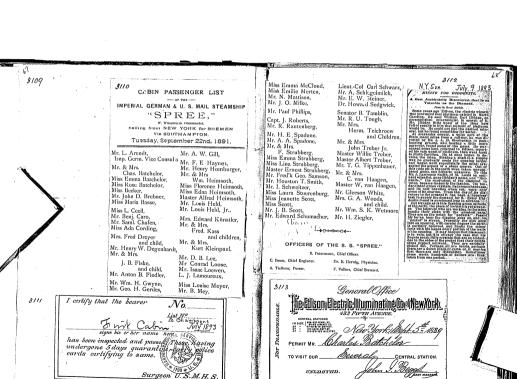
A control of the cont

be doing wrong to the people who sent him. He ought to full urwait he is going to do and stand, and the standard of the standa

dignity and earnestness that the audience made the walls of Cooper Union ring again and again with applause. It was some time before he could

Mc Shreman put into these works and vigent quantities of the control of the contr





Royal and United States Mail Steamer "CITY OF PARIS,"

From Liverpool for New York, Wednesday, Oct. 28th, 1891.

Captain FREDERICK WATKINS, Lieut. R.N.R.

PROCE-STUART W. MILLER Sungers-T. T. REVNOLDS, M.D. Chief Steware - THOS, THOMPSON

Mrs M M Butler Miss Butler

Mr W G Alkman Mrs E J Alexander Mrs C M Alexander Miss J Allen Mr Y Alonso Mrs Alonso Mr Watson Ambruster Mr Hermann de Andria Miss A Angier

Dr Rufus M Carlew Miss Edith Carlew Mr Carl J Carlsson Mrs Carlsson Mrs Carlsson Intant and Maid Miss Hulda Carlss infinite and Algorithms and Made and Made and Made and Made and Made and Made and Algorithms and

Mr Chies Bachielor Mrs Henry Baker Mr II A Barnard Mr C A Barratoni Mr C C Bartley Mrs Bartley Mr D H Bates Jr Mr Wm II Bates Mrs Batty Mrs Batty Mr Oscar Behrens Malor Lee W M Major James M Bell USA Mrs Bell

Mr Richd Dale Mr Clarence Engene Brown Miss A Buell

Mr Richel Dale
Mrs Dale
Mrs Dale
Mr Edwd C Dale
Mrs Wm Bryan Da
Miss L E Davidson
Mrs Delmar
Mrs Delmar
Mrs Dennett
Miss May Dennett
Mr C J Deny
Mr J R Duerden

Mr C A Du Vivier Mr Du Vivier Jr Mr E Duight Jr

Mr T J Edwards Miss Edwards Capt P H Ellis Mr Enoch Ensley and Valet Mrs Enoch Ensley Infant and Maid

Mr Feinhals Mr L G Fisher Mrs Fishe Miss Ethe' Fisher Mr L D Fisk Mrs Fisk Mr Theodore Fry MP

Mr W R Gentle Mrs F II Gbren Miss Gertrude Gheen Mr If M Gillig Mrs II M Gillig Mrs II M Gillig and Maid Mr Stephen Golder Mr S J Goodrood Mr T Greene Mrs J II Griffiths Mr A Grothe

Mr W McCormick Miss A McCormick Miss Lizzie McCorm Miss Mattie McCorn Miss Mattle McCormi Rev Jos H McMahon Mr James McTear Miss M L Mondy Dr De Witt C Morgan Mr Sydney Morgan Mr Sydney Morgan Mr John H Morrell Mr Isane Morris Mrs Morris

Mr Hahlo
Mr W Hoig
Mr W Hoig
Mrs G Morris Haller
Mrs G Morris Haller
Mrs A Linler
Mrs Ellia Hampto
Mrs Ellia Hampto
Mr W H Hastman
Mrs Henry Hartman
Mrs Henry Hartman
Mrs Henry Hartman
Mrs Hampto
Mrs Franklin W Habl
Mr Franklin W Habl
Mr Franklin Hodgeon
Mrs Hodgeon
Mrs Hodgeon
Mrs Habbel + Mr J R Northey Lands. Mrs L M Noyes

Mr C Isham Mrs C Isham Mr Edmund Ocur Mrs Ocumpangh Mr Jas M Ormes Mr B Ossulio

Mr H Sheldon Jarvis
Miss Jarvis
Mr E Lawrwere Jenkins
Mr S Ech W Johnson
Miss Louise Johnson
Miss Ellar F Johnson
Miss H W Johnson
Miss Johnson
Mr L H Johnson
Mr L H Johnson Mr James Parton Mr Geo Payne Mrs Payne Mr II Phipps Jr Mr Lionel de Pinto Mrs de Pinto Mr A M Powell

Mr C S Kelty Mrs A B Kendall Mr Austin J Kilker

Mr C F Rapp Mdme Ravogli Mille Ginlia Ravogli Mille Sofia Ravogli Mr Jules M Ravel Mr Amend I Ravol Mr Reilly Mr L M Richardson Mrs L M Richardson Mr M Ridgeley Mr II H Rimington Mrs Toro Robertson Mr High S Laird Mr G Lander Dr C E Laning Mr Juan Luis de Lizzrrali Miss Marie de Lizzrrali Mr Galikto Lopez Mr Saltis Luciana Lopey Mr James Loring Mr Alfred M Low

Me M Kidigeley
Mr H H Risington
Mr Turto Robertson
Miss Edna Robertson
Miss Edna Robertson
Miss Jessle Robertson
Dr J A Robiston
Mrs J A Robiston
Mrs J A Robiston
Miss Mangraret Roche
Mr B Rockwell
Dr E H Rockwell
Dr E H Rogers
Mrs Rogers
Mrs Rogers
Mrs Rogers
Mrs Wester
Mrs Joseph Roth
Miss Zhanie Roth
Miss Zhanie Roth
Miss Zhanie Roth
Miss Zhanie Roth
Miss Lene Roth Mr W McArthur Mrs McArthur Rev J McCarthy

Mr F C S Schiller
Mr Arthur Serivenor

Mr F W Scaman 16\*
Mr Albert Seiger
Mr G H Shawer
Mr E Shorrock
Mrs Shorrock
Mrs W H Singer
Mr Singer
Mr Singer

Mr W H Singer
Mrs Singer
Mrs Singer
Miss Marguerite Singe
Mr Wm H Singer Jr
Mr A Smith
Mrs J P Spence
Miss E L Syungeon
Mrs Starke
Mr Watter J Statham
Mr Albert L Swett
Mr Geo Sykes

Mr Wm H Taylor Mrs Taylor Mr W H Theolaid Mr G E Tilly Mr Robt M Tinker Mrs Chas Tosmsend Miss Cora Townsend

Mr Frank L Unger

Mr H Mebrülle Walker
Mr John J Word
Mr John J Word
Mr J J Warman
Mrs Warman
Mrs Warman
Mrs Warman
Mrs Warman
Mrs Warman
Mrs Warman
Mr Warman
Mr Charles Wieh
Mr Da Wells
Mr Da Garter Wiggins
Mrs Carleten Wiggins
Mrs Carleten Wiggins
Mrs Carleten Wiggins
Mrs Mrs J H Willis
Mr W H William
Mr W H William
Mr W William
Mrs Woods
Mrs William
Mrs Woods
Mrs Woods
Mrs Woods
Mrs Woods
Mrs Woods
Mrs Woods
Mrs William
Mrs Woods
Mrs Mrs Woods Mr Thos Worthington

Mr F Zan Mrs Zan M'lle Marie Van Zandt Madame Jenny Van Zandt and Maid Mr Guido Ziffer

3116 Mch 1 1890

M'GOWAN MISSING. Edison's Lieutenant Has Mysteriously Disappeared.

HAS HE BEEN MURDERED P

He Had \$1,800 with Him When He

Was Last Seen.

One of the minest representation of the property of the control of the property of the control of the property of the control of the control



N.Y. Sun Meh 5 1890

MISSING PRANK M'GOWAN. "Blandform threateners in a Lenter All Writer and On F. Hindhapped, who was an companion of O. F. Hindhapped, who was an experience of processing a large of the state of the state of mouth America for a reason series of the state processing allows a making energy effects to find processing allows a making energy effects to find state of the state of the state of the state of the deforming disassessment, which was effect deforming the state of the state to the state of the state to the state of the state of the state to the state of the state the state of the state of

3118

LISTE DES PASSAGERS DE CABINE SANARQUÉS SUR LE PROPERTO

CHAMPAGNE 

DU HAVRE POUR NEW-YORK

Le 10 Décembre 1892

M. S. A. Crozer Jr
Master S. A. Crozer 3rd
Gouvernante
Femme de chambre
Miss Contrat
Miss Contrat
Miss Carke et deux Enfants
Miss Contrat
M. G. Cuttella

M. Cyro de Azevedo M<sup>100</sup> Cyro de Azevedo Femme de chambre Nourrice Domestique M. Dinz Albertini M<sup>100</sup> Albertini et un Enfant Deux Femmes de chambre

3119

M. Hatchelor
M. Charles P. Boell
Mis Baltanche
Mis Baltanche
Mis Baltanche
Mis Baltanche
Mis Baltanche
Mis Baltanche
Mis Bertout
Miss Bertout et deux
Enfants
M. C. R. Benson
Miss Benson
Frire Blémond
M. Baldwin
M. Brown Fils
M. Boisson
M. Bernhard

M. le Dr E. R. L. Gould Mos Gould Révérend Greiner M. l'Abbé B. Geny M. Joseph Hirschfeld M\*\* Hallauer

Mme A. L. Jackson M. L. F. Jaccard

M. Kelly M. J. Kauffmann M<sup>no</sup> Kelley et un Enfant M<sup>its</sup> G. Kelley M<sup>nos</sup> Anna Karbf

M. F. Leonardo M. Lewis M. Leoning M. L. D. Luccia M. Laroche M. Lagana

M. Ehrman M. Ehrman Fils M. Ehrman Fils M. Ehrman Fils Mass Alice Escher M. Echeyerria M. Oscar Meuer M. Oscar Meuer

M== Maljean

M. F. Merz

M== Marchand

M. Malouf

Mile Malouf

M. G Duret
Mile Dangaix
Mile Dunlevy
M. W. Daly
M. W. Daly
M. Daly
M. Duke

M. M. Oppenheimer Mma Paulson Mma J. May Poole Mma Rosa Podesta M. Vittorio Podesta M. Pulg

Colonel A. F. Rockwell

Mass Rockwell

M. Georges Rambeaud

M. T. D. Richardson

M. H. R. Romeyn

Mass Romeyn

Mass Romeyn

Mass Romeyn

Mass Riboul

Mass Riboul

Mass Riboul

M. W. E. Rice

M. E. Rafer

Mme B. L. Shermann M. F. C. Smith Mme E. Scherrer et deux Rofants Mac St-Paul et un Enfant M. J. Sarriera et un Enfant -Révérend Terrieu M™ Tyng

Femme de chambre M. Galvan M. F. Galvan

M. Eggemann Mile Eggenschweiler M. Ehrman M. J. C. Findlay M. Friedlaender M. Gios. Ferrando

M. le Comte Artero Goribar
Alme la Comtesse Goribar
M. le Dr. C. L. Gibson
Mile L. L., Gibson
M. M. Gibbon
Alme Gibbon
M. M. Gibbon
M. Gulbon
M. Gudrin
M. Gudrin
M. Gudrin
M. Goodridge
Mile Goodridge

M. L. P. Vallois M. Vallois M. Vallier M. R. P. Warner Me Wilkins M. G. H. Wells M. J. A. Waldburger M. Yandham Me Wyndham et un Enfant Penme de chambre Penme de chambre Veleve et un Enfant M. Welh M. Welh M. Williams M. H. R. Williams M. H. R. Williams M. Wilg

### FRANK M'GOWAN 1890

## LOST AND FOUND

The Disappearance of One of Wizard Edison's Assistants Pully Explained.

BAD NEWS FOR HIS FAMILY.

### ile Is Now in the Employ of the Colombian Covernment and Is Said to Have Rejoined au Old Plame.

All principal on the carried and the principal of the pri

of this date in linears, a short time after its pulse-cialis. Here it were per uncon-cialis, the state were per uncon-cialis, the state of the state of the state of the As Mr. Folger had saided from this point in case which the state of the state of

is all sugger and these securities of some fitting of the suggestion of the suggesti

School Heur Detroit News Sec 17 1892 92 3/21

or a pecuniary name. The ringle schiers ment of lighting by incondescence is suffi-cient to give immortality of fame to any man. When the biography of this case man Edition shall be written, this intellect will have to be characterized as absolutely

Antin Thursday 3/22

Boton Rauscript Sec 24 1892

BALGON MAUGULPP

SECULATION AND SECULATION SECULATION SECULATION SECULATION SECULATION SECULATION SECURITY SECU

commercial success.

Inventors in this line then turned their at-Inventors in this lies then turned their fact-netion to pre-design an incandessent elec-tronia. In which is, a light which should come from the state of the state of the state of the through some substance; and family the present incandences lamp was invented. It for the state of the state of the state of the state of a flightness to rithered of earbon in-cended of a flightness to thread of earbon in-cended of a flightness to thread of earbon in-tended of the state of the state of the state has been excluded. The slepticity passes into that slament by means of connecting which of platfanna, and makes it incender-tically the state of the state of the state of the which we have been assumed to the state of the which we have been assumed to the state of the s

where of platfarms, and makes it formed a superior of platfarms, and the sale of which time, the flamests will list on an except for size him flamests will list on an except for size him flamests and the sale of which time, the flamests are size of the sale of the sale

The second claim of the Edison potent is the one sustained, and it is very broad claim; for it rouds as follows: "The combischoling for it would as follows: "The contact and the contact and the contact with a resister and the contact with a resister of the contact with a resister in the contact with a resistant with a res nation of carbon filaments with a reselvent

here very alree in less sections of their rights processing, such as the section of their rights, processing, such comes in placets, and assemble as white other commands engaged in the basic regions. The section of the placet costs of the section of the section of the placet costs to the dispersion. Corr. scape, when some openior of the refers which as the placet costs to the dispersion. Corr. scape, when some openior of the refers which as the placet costs to the dispersion. Corr. scape, when some openior of the refers which as the placet costs to the dispersion. Corr. scape, when some openior of the refers which as the placet costs to the dispersion. Corr. scape, when some openior of the refers which are to have passed upon the the section of the theory of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the section of the local dispersion of the section of the sect

end of its term.

The patent was granted Jan. 27, 1880, and, the term being seventeen years, the patent would naturally expire in 1897. But there would askurally eagine in 180°. But there are depositations which may not forward the same of the same of the same of the same of 180°. The application for the same of 180°. The application for the same of 180°. The application for any of the same of 180°. The application for the same of 180°. The same of 180° of 180

when the Canadhan patent for the same when the Canadhan patent for the foreign patents were not like that can the foreign patents were also patents was made here for till after the applications was made here for till after the application was also patent greated for an invention "precedent pro-teating and the same patent patent patent application tiller as to what it is decident as approach Carrie has the Supreme Carrie and the application tiller as to what it is decident as the patent carried the Supreme Carried and the patent carried and the patent patent and the special carried and the patent patent and the special carried and it they do so had to be applicated to the patent patent patent and the special carried and they do so had to be applicated to the patent patent patent patent the application for and they do so had to be applicated to the patent patent patent patent to applicate the patent patent patent patent patent the application for the patent patent patent patent the application for the patent patent patent patent patent the patent patent patent patent patent patent patent patent the patent patent patent patent patent patent patent patent patent the patent pat

the light of the comparatively short time—as the light of reward. So soon as anybody ands a substi-

tite for the carbon-dimunst of per the glass hill the monopoly will be broken. But the summer is provided by the summer is the summer in the summer is a fuzzy, and a mecosity; and therefore yet will be for the interest of the owners of the put-act to sell the burges of a reasonable price, and to sell the burges of a reasonable price, and to sell the burges of a summer is a summer in the Should they prime a different course, the only reason'y will be the weight of public epidese, or a dissue of the incandencent lamp on the paint of the public.

-. ... vone onvakreeman in ....

Edison's Sustained Right to the Incandescent Lamp Brings No Profit.

THE GENERAL ELECTRIC COMPANY NOW CONTROLS THE ENTIRE FIELD.

End of Seven Years' Litigation Over the Little Lamp.

In Awarding the Hight of Patent to the " Wirard " the United States Circult Court of Appeals Swreps All Other Incandescent Lamps from the JANUARY Field, Giving the General Electric Company a Monopoly of Incandes-cent Lighting-Millions Spant in Linigation-Edison Made the Light a Commercial Success-Hendjusting the Business to New Conditions-The Patent Soon to Expire-Points in the SATURDAY Court's Important Decision.

The electrical world is readjusting itself to

Court's Inspertion Declaration.

The decisions devel for implement tout of the control of the co WORLD: HE

Since Mr. Edison, over twelve years ago, made the electric light of practical value, its use has aprend to every country on the giote, and it has created a new industry of

List has Perfect to very country as the country and the country country and the country country country country provided the country c property vales, has because Mr. Dillam susceptible generative blas analyses has region in great rate personal region in the process of the pr

on's putents. But askie from the property interests in the 

until the spides now familiar to restrict, in which we have a bouilier on the sterroit of the project, which was a bouilier onto the sterroit of the project, which was a bouilier onto the sterroit of the project, which was a bouilier onto the sterroit of the sterroit of

Commence of the control of the contr

green and the second of the se

manachera.

Rasa, in its Perseli opecification, followed the ciple of high revolution to an externe, used included the distribution to the externed to the second of the control of the co



3120 A.Y. Sur Jan 26. 1503. HENRY GOEBEL, TRYENTOR. Sum - 1093 We 20

PIONEER OF ELECTRIC LIGHTING. Re Tella How He Invested the Incandescent Lamp Long Before the War, but Thought There Was No Money in H-He Will Not an Immete of a Charttable Institution.

as Famous of a Castellate Institution.

Hard Todavid, the nice beam behinded with the Castellate Institution of the Castellate

The sterr with the clima tails is operating the continue treatment to the continue treatment treatment to the continue tre



the Johnes Company decided set to bury.

An included and was administer, worth
and the Johnes and the Johnes

.

"Secretary of the control of the Con The control of the co It would never used nor me, or mention in the first that the same that t highly writinest gestion; we saw here the time into the control to The state of the s 

1 11

"The property and the sets of many lawships and the sets of the property a 3126

3/24

The Electric Wizard's Future Work, and the Problems He Hopes to Solve.



A second of the part of the pa



Status in Edison's Library: "The Triumph of Electric Light," (The genius of Light prorturalog a gas lamp and holding aloft an

so the residence with a place which we have been a second or and a second or an extra sec

The second secon

Section of borrion contributes. Which is contraction of borrion contributes and the section of the contributes of the contrib

difficulties were earmone. I know the thing was a written and the state of the stat

Anna Attive moment for following reserva-nces and the end produces of a with the control of the control of a with the control of the control

84



"llave a cigar."

"Gilles and gilles and

titles, and Their shring 'theorem' the mathed as to despise with cloth of their shrings' effective the mathed as to despise with cloth of their shrings are shringly as the shrings and their shrings as the shrings are shringly as the shrings are shringly as the shringly as the shrings are shringly as the shringly as t 3

Second being patents. Editions will consider a second being patents. Editions will consider a second being a se

The property of the property o

Jack Studied in the country the farth from the first price of the pric

Grisser. "Search printer in a ship wood. I ship to a ship wood. I ship to a ship wood of the year of the ship wood of the year of year of

Tours George Endsdy Joseph Triges Tooking chat the magger Vienna

3/28

with green, it with ultimately develop the protect, man, it with ultimately develop the protect, man, it with ultimately develop the protect, man, it with the protect of the forces of the protect of th

86

3129 WATERPORT: O Permit until farti evening IC grade September 12 (O) (O) Schleier Freiber (O) Schleier Freiber

Gibraltar Mch 10 1893

LIST OF CABIN PASSENGERS 3/3/

TO SAIL PER

### S. S. "NORMANNIA." C. HEBICH, COMMANDER

Thursday, June 16th, 1892. Mr. Chas. Cohen Mr. Chas. Castan

Mrs. Kate Dixon
Miss Kate Dixon
Mrs. A. Mrs. Louis Dalmie
Mrs. L. Distoroppid
Mrs. P. Libratespid
Mrs. P. L. Deval
Mr. Geo. L. Deval
Mr. Geo. L. Deval
Mrs. Prank L. Dums
Mrs. Davidson
Mrs. Semie Doxg
Mr. Devey
Mrs. Devey

Mr. M. L. Eisemann Mr. August Evers Mr. Win. Eisers Mr. Jacob Eiserbard Miss Dora Etter

Miss Dora Eiler
Mr. John Farrel
Järes Wun. Hildrenh Eiski.
Miss Field
Mrs. Idol Fonder
Mrs. Idol Fonder
Mrs. Idol Fonder
Mrs. Miss Field
Mrs. Remansel Fielder
Mrs. Remansel Fielder
Mrs. Remansel Fielder
Mrs. Remansel Fielder
Mrs. Annie Friedmann
Mrs. Annie Friedmann
Mrs. Annie Friedmann
Mrs. Remans Su. Fielder
Mrs. Hiller Fielder
Mrs. Hiller Fielder
Mrs. Hiller Fielder
Mrs. Fielder
Mrs. Hiller Fielder
Mrs. Hiller Fielder

Master Edwin A. Pletoc Miss Miss A. Cordiner Mrs M. A. Cordiner Mr. S. M. Cordiner Mr. E. de Grassmont Mr. Deals Cortesbeliser Mrs B. Gerson Mr. Wn. Gussor Mr. Wn. Gussor Mr. Wh. Gussor Mr. Wh. Gussor Mr. M. Gussor Mr. W. Guss

See A. Short, American

John S. March, American

John S. Lander, Ameri Mr. & Mrs. F. Arsemates Mr. L. Adolph

Miss Ellic Gorman
Mr. Felli Hadiley Jr.
Mr. J. R. Hadil
Mr. M. T. Horison
Mr. M. T. Horison
Miss Rose Hart
Sensor & Mallower & name
Miss Rose Hart
Horison & Miss Rose Hart
Mr. J. Holison
Mr. S. Holison
Mr. J. Hali
Mr. J. Hali
Dr. C. R. Holison
Dr. R. C. Hethelsomer
Dr. R. C. Hethelsomer

Mr. Jacob Herman
Mrs. Henry Howard
Mrs. Henry Howard
Mr. John H. Jiveand
Mrs. John H. Jiveand
Mrs. John H. Jiveand
Mr. Morie S. Hahn
Mr. & Mrs. Advis Hammer
Mr. Morie S. Hahn
Mr. & Mrs. Advis Horman
Mr. & Mrs. Advis Holeman
Mr. & Mrs. Then. Heinroth
Miss Marie Heinroth
Miss Marie Heinroth
Miss Prodit Hour
Miss Friedt Hour
Miss Christian Houri
Miss Christian Houri
Miss Christian Houri
Miss Harriett Hall
Mr. Edimand Hour Miss Garn Bezer
Mr. With, Jerisho
Mr. & Mrs. Win, Jenhinson
Prof. & Mrs.
Worshey Johnson
Mr. C. W. L. Johnson
Mr. Theo. W. L. Johnson
Mr. Theo. Mrs.
Mr. Fried, James Johnson
Mr. Fried, James Johnson
Mr. Meyer Jaramiharsky

Mr. Gor W.-M. Keen
Mr. J. B. Loher
Min. I Ippert
Min. I Ipper
Min. Min. Min. Ipper
Min

Mr. A. Selinger
Dr. & Mrs. Theod. Schloostmann
and child
Mrs. J. Schneilituder
Mrs. W. G. Spites
Mrs. Wills. Schilling
Mrs. Wills. Schilling
Mrs. Mills. Schilling
Mrs. Barin Schorn
Mrs. Earni Schorn
Mrs. Learn. Schorn
Mrs. George Stock
Mrs. Learn. Schorn
Mrs.

Dr. Y. F. Marchonald Mr. Chremen Murba Mrs. Holes Murba Mrs. Holes Murba Mrs. Holes Murba Mr. Pertl. Marba Mr. Levell, Marba Mr. L. Meyer Mrs. Lones Mildel, Mrs. L. Mrs. Lones Mildel, Mildel, John Mrs. Lones Mildel

Mr James North Mr. H. F. Oppenhelmer
Mr. & Mrs. Albert L. Ordean
Mr. J. Oehnes
Mr. Hugh Ogden
Mrs. Mina Oppenhelmer
Mrs. Mina Uppenhelmer
Mr. & Mrs. Fred. Oghsmann

Mr. R Mrs. 1 Mrs. Samuel Plan Mrs. Samuel Plan Mr. Franklis Pepper Mrs. Julius A. Payne Miss Helem Payne Master Julius Payne Master Julius Payne Mrs. Perrine Mr. Leo, Pianter Mrs. Hearty Perthes

3/33

And the second s

7

tellection : In the control of the c

smith curve of coupies intend by condensited, while and in previously common of the liberalization of the previously complete of the demandation of the condensities and administration of the control of the condensities of the prints Association for the condensities of the condensities

gression per second may be laken as a current of use many and an alternating current of one ampaire shall mean a current such that the square road of the time was a current such that the square road of the time was considered as the square of the design at each insta-12. That instruments constructed on the principal the contract of the square of the construction of the third of the construction of the construction of the third of the construction of the construction of the unstance of the construction of the construction of the sample of the construction of the construction of the sample of the construction of the con best districted at the Booth of Patter American Section 2017.

"The State of the State of American Section 2017.

"The State of American Section 2

3/32

Mr. & Mrs. L. G. Oulolle

Mr. & Mrs. F. J. Ranney Mr. & Mrs. Jac. A. Raynolds Mrs. E. Rand Mr. Ross Mrs. Ross Mist Ross

Dr. William T. Bull

### S. S. "AUGUSTA-VICTORIA,"

H. BARENDS, COMMANDER. Thursday, March 2d, 1893,

From NEW YORK, for NAPLES and GENOA,

Mr. Emanuel Koscherak

Mr. J. A. Kugelmann

Miss Leila Loughlin Mr. & Mrs. F. Lovejoy

Mr. Victor Klein

Mr. E. L. Meyers

Mrs. F. A. Monti

Miss E. B. Monti

Mr. Nath. B. Norton

Mr. W. B. Palmore

Mr. & Mrs. Geo. C. Rand

Miss Mary B. Rodgers Mr. Edmund Réville

Prof. L. Monti

Miss Rand

Messrs. Rikes

Mr. L. H. Smith

Graf. Schweinitz

Mr. H. Shorey

Mr. David Soni

Mr. Frank W. Sanger

Mr. Max von Stutterheim

VIA GIBRALTAR.

Miss Rosalie Banner and governess Mr. Robert Lenox Banks, Jr. Mr. Chas. Batchelor Mrs. W. C. Bullitt and two maids Master J. C. Bullitt Master W. C. Bullitt Miss Hattie Brainerd

Mr. & Mrs Peter Banner

Mr. & Mrs. Isaac S. Boyd Mr. R. J. Cuddihy Miss Emma Carpenter Miss Juliet Childs Mr. Charles H. Connor Mrs. Louisa W. Comegys

Mr. Carl Edelheim Mr. James H. Ebersole Mr. Almon Goodwin

Mr. Samuel Hopkins Mr. W. H. Hervey Mr. J. Manchester Haynes

Mr. Edwin Ives Mr. & Mrs. George Junkin Mrs. C. F. Johnson

Mr. Willis D. Wood Mr. Wm. M. Whitney, Jr. Mr. & Mrs. John Wales Mr. A. L. Wilson



3/38

3199

International

Electrical .

The World's Columbian . Exposition -

is invited and is bereby authorized to sit as a member of the Unternational Electrical Congress of 1893, at Chicago, U.S.Zi. Abectings of the Congress will be beld in the Birt Palace, at the Lake Front, opposite Blams Street,

3/42

N.Y.Sun Aug /1 1893,

Gold, Silver, or Paper Money

We will purchase at a liberal premium, in exchange for our certified checks in exchange tor our certified chocks, payable through the Clearing House, Gold Coin, Standard Silver Dollars, United States Notes, Certificates, and National Bank Notes, and Checks on the Assistant Treasurer at New York.

7IMMFRMAN & FORSHAY. BANKERS.

II WALL STREET

3/40

Congress

from Buguet 21 to Buguet 25, inclusive.

3unc 1, 1893.

3141

Dresent , the , enclosed , card , of , invitation, either . at . the . boor . or . to . the . Committee on . Grebentials. . at . the . time . of . the . opening of . the . Congress.

Blso. . kindly . signify . at . once . whether . or not , you . can , accept . . . H . programme . of . the Congress . is . enclosed.

111(nois. . V.S.R.

June . 1. . 1893.

GARRIELD NATIONAL HANK.



AN OLD RAILROAD MEDAL;

AN OLD RAILROAD MEDIAL; great, and the road is much higherd by the heavy cars and or and for enough green from the quarter and Letchampton of the cavery far to the control of the cavery far to the control of the cavery far to the cavery for the c

was now as that the trainway was in the some years after the present at I way between Gloucester, and his boyhood he had many art hours a ride upon the trucks which brought the stone from the quarra a fide upon the trucks which brought a portion of the trainway I the Leckhampton. We delive that use.—The Landon Enginer.

### 3144

## M.Y. Herald Avo 28 1893 HAYWARD A. HARVEY DEAD.

Heral Out On One 2 01 He Is the Author of the Process for Armor PlatesBearing His Name

Hayward A. Harvey, the inventor of the Harvey process for armor plates, died at his home at Orange, N. J., early yesterday morning. He had been seffective from diabetes for the last five



### 3145 Popular Electric Monthly



PROF. ELISHA GRAY. April 15 1893

3144

3146 Phil. Press Feb 5 1893 EDISON PLANNING VICTORIES ANEW.

The Wizard Believes Himself on the Verge of Great Things.

A MAGNETIC ORE TRUST.

He Controls in Himself All the Beds of the Mineral.

POWER FROM LUMPS OF COAL,

His Latest Project New Under Way. Mr. Depew and His Experience with Business Loans-Ac-

with Business Lease—Acc.

| Comparison | Com

and to me the other day; "I make a great man experiences; my work was become down it was become down in the mean completed, and the highlight was made inmelies dute my lighting was made inmelies dute my statistica to mention of the man and the man and the make a make

pa night attener covers to be old through in the control of the part of the control of the part of the control of the part of

Geodes clarity and the control of th

CII is probably due to the fact that he reCII is probably due to the fact that he reCII is probably due to the fact that he reCII is probably due to the fact that he reCII is probably due to the claim of the compelled to poddle his fewerines to gightthat he pear amall beed to the claims of control upon a very due to the claim of the control upon a very due to the control upon a very due that the probable of the control upon a very due to the control upon the c Edison's New Work.

before it of the companion of the compan

"Zones is not an experience for the feel in the feel into the has pessed the time when, as the feel into the has pessed the time when, as the pessed in the feel into the feel into the feel into the feel in the feel into the feel in the feel into the feel

The Wizard's Next Step. The Winter's Next Step.

"As soon as Edition solves the problem upon which he is now working and gain his nineing plact host good resulter profit is a high part of the problem. The property of the property

has saider "promoterpols, a" over which in a beautiful production, in the second control of the second control

be emissioned and now to oring this about, the second of the control of the contr

the best material for processing that like-ment. Will Exop It a fixers.

It is probable that Mr. Edison will, if he discovers this process, protect it by secreey rather thou by application to the Patant Oline, yais an all proposes to pro-ference of the process of the pro-ies of the process of the pro-trou ore, and when he was asked whether it would be possible for one must ocarry in bit burnin a server of much mightly import it would be possible for one must ocarry in bit burnin a server of much mightly import it would be possible for one more or and a consequence of the pro-trough the property of the pro-lated of the pro-lated burning of the pro-trough of the pro-tro

heep between one's lips the neighborhost

"Shear with to do yours' et age, not between the

tardry, and filliough his fichieveness in

tardry, and thillough his fichieveness in

tardry, and thillough his fichieveness in

tardry, and thill tardry, and the

tardry, and the tardry, and the

tardry, and the

tardry, and the

tardry, and the

tardry, and tardry, and the

tardry, and tardry, and the

tardry, and the

tardry, and tardry, and the

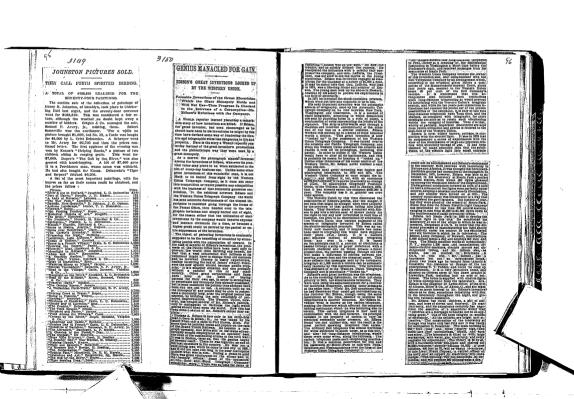
tardry, and the

tardry, and tardry, an

3/48.

MAGNETIC SEPARATION OF NEW-JEESEY ORES. JALOSTERIO SERVALATION OF THEY ARREST ORDER.

Dever, W., S., March, 13. Spendin, v. complexely dependent of the Window Servander, dependent of the Window Servander, dependent of the Window Servander, comed has purposed at similar servander, and the servander of the Servander of



Airship of the Great Inventor Nearly Completed.

MODELED UPON THE KITE

Huge Flying Machine Which Flies Through the Air.

PRINCIPLE OF EQUILIBRIUM.

Remarkable Career of Hiram Maxim as an Expert Mechanic.

TRIAL TRIP WITH THE AIRSHIP.

LORDON, Sept. 12.—(Special Correspond-cesse.)—The problem of how to travel through the problem of how to travel through greater special time man can now travel on the cerem has now reached a slage at which ex-perts can with some comblesse present the re-ports can with some comblesse present the re-verse that the problem of the problem of the will be an accomplained last, and stelly lines across the occur will be the Aurored in-vastances of enterprising capitalists.





standing at the hadder econing half a deem file the configure of a cases, 1 meeted the phateness and the cases, 1 meeted the phateness and the cases, 1 meeted the phateness and the case of the cases, 1 meeted phateness, and the case of the cases, 1 meeted the phateness and the case of the cases, 1 meeted the phateness and the cases of the cases, 1 meeted the cases of the cases, 1 meeted the cases, 1 meeted the ward impaints or "pash" of the acress, 1 meeted to ward impaints or "pash" of the acress, 1 meeted to the cases of the cases of the cases of the cases of the ward impaints of the cases of the cases of the target of the cases of the cases of the cases of the target of the cases of the cases of the cases of the cases and spaced to perfect associations.

before the ling flexion, an events wellers pleas, the control of the line and pleased to profess the molecular and pleased to profess the molecular and pleased to profess the molecular and pleased to the line and line and

The approximation of the appro

valuating public time. 26: Num. table it say a significant of the public time. 26: Num. table it says a significant of the size of the siz

SEPTEMBER 24, 1893-

inlacty. These figures degreed of course upon a nature of water and suphila. The margin of subject of water and suphila. The margin of subject course is as barge that in time, the subject of the subjec

aggreen the few team interactions. Whereast is making with the property of the shy decrease we have no means of open-similar. The contraction of the contraction of the con-cept of the contraction of the con-cept of the contraction of the con-cept of the patterns. The framework is con-tracted with consideration contracts in the proof size of with consideration contracts in the proof size with consideration contracts in the proof size with the contract of the con-traction of the contract of the con-traction. The contraction of the con-traction of the contract of the con-traction. The contract of the ship with the contract of the contract of the con-traction. The contraction of the con-traction of the contract of the con-traction. The contract of the con-traction of of the con-

Control of the Contro

of ten years." commenced then to inspect the most re-ble boiler I over saw. It was inclosed



MAXIM BYPLAINING HIS THEORIES. MALIN EXPLAINTS INTO THEORIES.

In a house eight feet long, five feet wide at the base, and about six feet high. The sides of the house were of thick cloth woven from pure asbestes, and the frame and top of the fallment from. Within, viewed from a peop hole, the entire floor was a mass of small discovering the contraction. 

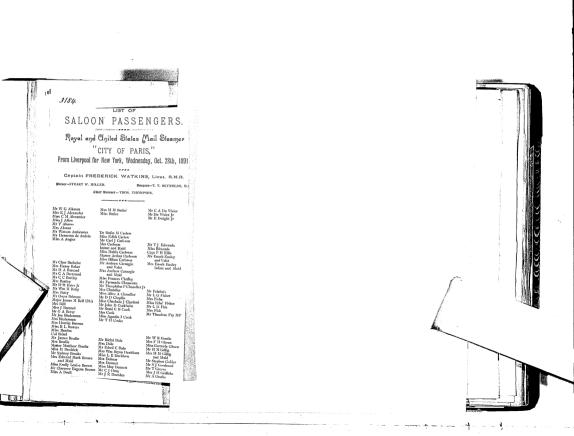
100

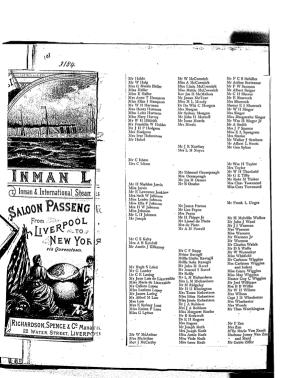
the control of the co

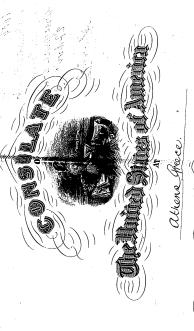
The street on principal principal to according to the control of t

3153

Geni Mangiri Schienecksky wurke, General Ebestrio Co., Scheenecksky, Now York, Proposers: Thes. A. Mildess, Wood. 1998. In Manches and Charles and Cha







OALL TOWNOON THESE PRESSIES SILVIN COUR CREENINGS

The universigned Aring & Manast Jan Justo Statum & Food - 7 YSmelies Cong Description.

Conoue

brown high

ed States of America leedy whom it may soncern to permit

United States with his week and two Sounghier Charles Batchelor Straight regular Mouth

bearded Chin

Nouse Complexion taix Hair.

regular

From 232 POOL LIVER STOS NEW YORS

SALOON PASSENG

MAN

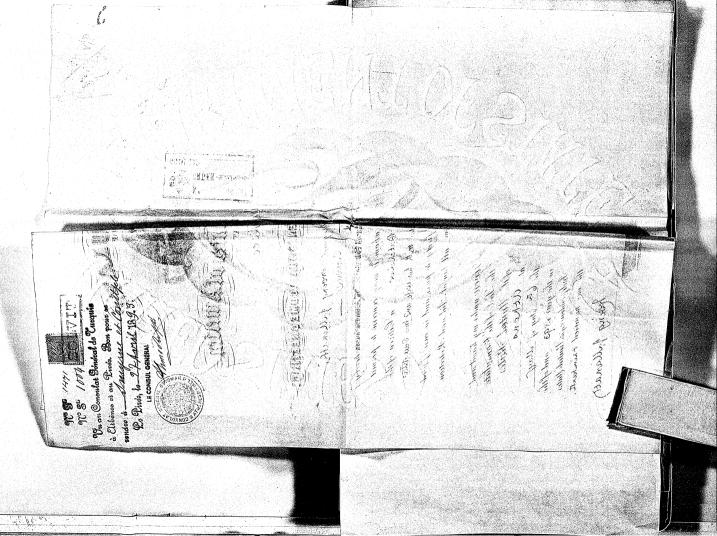
Given under my hand und the Seal of the Consulate of the United States

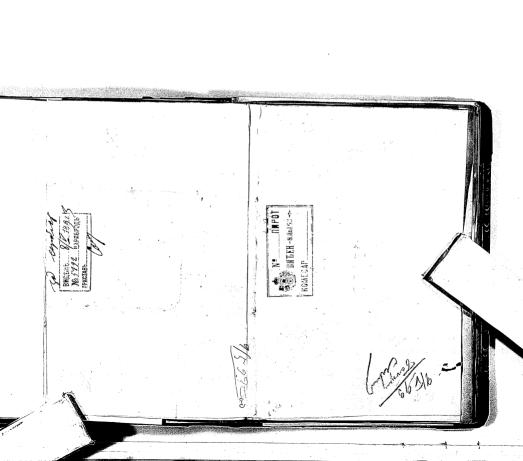
all bauful Shid and Rotection

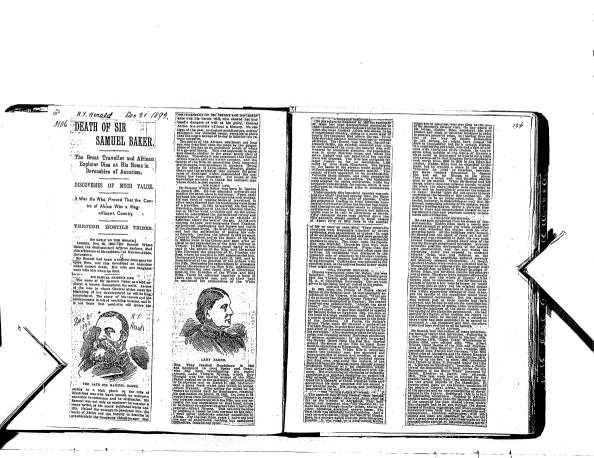
achens

Heery fillanast

Independence ful Uniteds







3/54

3158 Paintinge made by an artist, with the air Brush, are superior in pure tone, soft finish and pleasing effect. Gir Brush paintings are of more value as works of art than any other. The public is beginning to realize

this fact. A word to the Progressive Artist is sufficient. Use the Cir Brush made by

### THE AIR BRUSH MFG. CO.

ROCKFORD, ILL., U. S. A. EXHIBIT W. C. E., DIV. E. POST L. NORTH END GALLERY, LIBERAL ARTS.



3166 | Commander Cameron, the Famous African Explorer, the Victim of a Fall from His Horse.

DIT COME TO YAU BERRAIG.

LONGEN, MORTÉ M.; BAB-Tho distinguished
Affines, Morté M.; Bab-Tho distinguished
Affines, And Sand Marian and Control and Affines
Affines a borne yestersky and died a little more
from a borne yestersky and died a little more
land the state of the state of the state of the land the state of the state of

and users regulated consciousness.

HIS BART LIKE THAT OF SPECK'S,

HIS BART LIKE THAT OF SPECK'S,

OR SHART SHART LIKE THAT OF SPECK'S,

THE WORLD SHART SH



COMMANDER V. MOTTET CAMMOND, it., We committee the following of the princip distinctions and the following of the princip distinction of the following of the princip distinction of th COMMANDER V. LOVETT CAMERON.

3164.

Ecut wed. EG. wtd . "Waterpall Forge." Fel 10 1894. Mr. George D. Burton, of Boston, before the Franklin Institute of Philadelphia, last Wednesday, showed the method of heating by plunging the metal to be heated into a bucket of heating by pringing the metal to be neated into a bucket of water and passing a strong current through it. The ap-paratus consisted simply of an ordinary wooden bucket con-taining a large sheet of lead which formed the positive pole and an iron bar laid across the bucket forming the negative pole; the metal to be heated was held in the tongs, which were rested on this iron crosspiece and dipped into the liquid as desired, thus avoiding all flexible connections with the tongs. Two ordinary nails held in the tongs and dipped into the liquid were heated to a welding heat in a few seconds, after which they were welded on an anyil with a few blows of the hammer., In another experiment they were welded by simply allowing them to fuse together. A large soldering iron was heated red hot in less than a minute. Pieces of clean steel were heated to redness to show that they were

not burnt, as in the ordinary forge. The solution which he found to be the best, after a long series of experiments, is made of a solution of ten parts of carbonate of soda and one of borax, dissolved in water until the specific gravity at 70 degrees is 1.150. The current was taken from the street mains and at about 240 volts. It appears that no means of regulating the current were used, as the metal itself and the depth of immersion acted as the regulator. He claims to have made the first public exhibition as early as October of 1800.

CABLE ADDRESS "HOUSKEN, PHILADELPHIA."

METALLIC GIRCUIT TELEPHONE NO. 3937.

TELEPHONIC CONNECTION WITH THE

PRINCIPAL EASTERN CITIES OF THE UNITED STATES

LABORATORY,

PHILADELPHIA.

OFFICES,

ROOMS 1105-1105, BETZ BUILDING, NEAR PENNA. R. R. DEPOT, PHILADELPHIA, PA.

DEAR SIR:

3/68

We beg to inform you that we have entered into partnership as Electrical Exports and Consulting Electrical Engineers, under the title of Houston & Kennelly.

An extended experience with the commercial applications of electricity, the machinery and apparatus employed therein, and the scientific principles upon which such apparatus is constructed and operated, will emble us to undertake advantageously to our citients, expert work in patent examinations or law suits, and to give consultations on the design, construction, or installation of electric machinery.

Our thoroughly equipped laboratory will enable us, not only to carry out physical investigations in connection with patents and technical processes, but also to calibrate and standardize electrical measuring instruments, and to make electrical tests or measurements generally.

Correspondence is solicited. Professional work will be undertaken in any part of the country. Telegraphic requests for consultation will receive prompt attention.

Yours respectfully,

EDWIN J. HOUSTON, Ph. D.

Shas. Betchelor Ey.

33 W. 25th St.

HOUSTON AND KENNELLY—It will doubtless surprise many of our readers to learn that two genule-men well snown in the electrical ideal many of the state of the connections of the state of the connections of the state of the connection in the state of

laxer determined to saver the connectation that the control of the

continues have decided to establish in Fig. 1. 19.4., part of the property of

Internal Control Contr

qualities are bold. Prof. Houston has been are prominently before and a ladf, and Mr. Kennelly in more recent years have been received in the ladf, and Mr. Kennelly in more recent years have been trained, that any extended reference to the work of eithers is unknowned to the ladf, and the ladf when the company in the days when their company in the days when the company in a world-wide reputation is best known, that is later years has trickly has not duckward, and the public will now have the practice and the public will now here the profession and the public will now here the profession and the public will now here the profession and the public when the corporates a minded in

and of the who made product of the control of the c

The state of the s

3170

## HE IS A HUMAN PHONOGRAPH

M. Jacques Inaudi Performs Marvellous <u>Feats of Mental</u> <u>Calculation</u>

AN ARITHMETICAL PRODICY.



the impercable memory of a phonograph, allied to the almost supernatmal powers of a calcalating machine that works with vertiginous rapidity—thereyou have insudi!

This young phenome—

non-be' in a vertiable noulley-be the inseraddition to the long list of "lighting caise," later," a list which includes such nomes, as Very, Nangitunel, Biblier, Gustrav Basin, White arter light the soliences at Kreiter's Ball's see the set drup cup up and theirseries confronted by two immessa blackplants are the set drup cup up and the contraction of the confronted by two immessa blackpreparation," for one screpts at little pageway, which, creating the exchestra, connects the sales with the most consecution of the contraction of the contraction

e with the nudlence. treduced by the simple remark that this Jacques Inaudi, the calculating wonder



A year into folies the scene, and, picting hinder upon the short "ray," creases his hinder upon the short "ray," creases his hinder to the same with the sam

of main this is whose estimated process in our of federace are of federace and the second process of t



Indiced, it is only wram over all familiar with posen that I have become at all familiar with posen that I have become at all familiar with "As a matter of fact the steph of faunce of particular to the steph of familiar particular recognizes its value. If see the sign which stands for It have to translate it, as it were particular to the steph of the sign of the country of the steph of the steph of the particular to the steph of the steph of the particular to the steph of the steph of the country of the steph steph of the steph of t

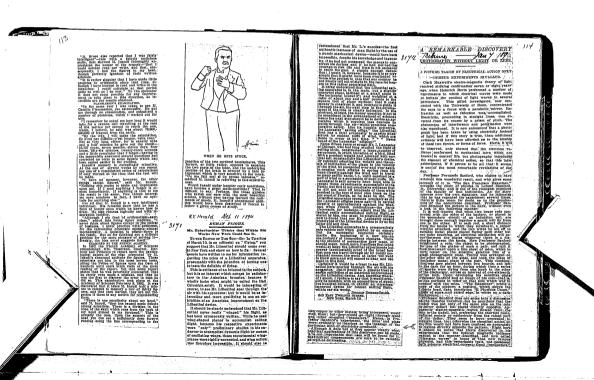
Wel 25 Herald

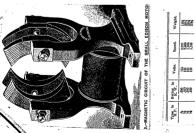
112

tremely-large in circumference, besides being very irregularly shaped.

"Al. Breen took very accurate measurements of any bread, Openionsly enough, I underwent of any bread, Openionsly enough, I underwent to the control of the cont

WHEN HE IS DOING SOME RAPID THINKING





# Sunday Call Jun 3 4 Hewark h.). THE OGDEN-EDISON MINE.

The Inventor's Big Works in Sussex

THE OUDSEATEDINGS MINE.

The Investors MIR Works in States.

Nov. 60 (Lafferty - IMW )

The formed polyment in the base known at the control of the control

'under-Tthe 'naw', is will be 5,000 tous' lay, and '300 men will be required to e work of 1,500 under the old gastem-thunger, which will be 'completed in 5, four wooks, were begun a year account of the second of

## Bullet Moof armor. A.Y. Liebune June 3 1894

There is excitement in France about the alleged sale of the alleged invention of M. Turpin to a foreign power, and excitement in England about Herr Dowe's bullet-proof cutrags. M. Turpin processes to have invented a machine which can sweep an army out of existence, or annihil-ate a fortress. The French Chamber discussed

ate a fortrees. The Prench Chamber discussed it and him with parision, and the Minister of War had a, bad afternoon of it, but no definite decision was taken. The chemiat mensitime in other countries has been saying with unfaltering decision that M. Turpin's pretensions are chemically budgers. ing decision that M. Turpins precensions are chemically ludicrous. The properties and limits of explosives are known, and are not consistent with the claims of M. Turpin.

With the comms of m. Turpin.

Herr Dowe's culruns, tested last week in the prosence of military texperts, has been nightly tested and exhibited this week at the Alhambra in iested and exhibited this weeks at the Albandhen in the greatines of experie and the public. The condi-tion of the condition of the condition of the condi-posability of deception or trick. Officer as I moves consulty took part in the proceedings. The Les-lacement office with corolle carridge, Novales, The Les-lacement office, with corolle carridge, Novales, The Les-lacement office, with corolle carridge, Novales, The Les-lacement of the corollege of the thick, and bullet from the same ride did fail, of the bullet of the corollege of the corollege of the way decay demonstrated, and point was dearly demonstrated, and point was dearly demonstrated, and point and the property of the waste of the corollege of the corollege of the corollege of the million delitate for it. the price acked by Herri united adultate for it. the price acked by Herri

million dellars for it, the price aniced by Herr Bushleys, M. Akazim appressed on the seims, or rather in the papers, centry announced, that an in himself-rurwised in two hours and belief, the paper of the papers, centry announced that a million of the papers, centry and belief, the paper of the papers of the fig. do not the inst-tuctive plaining of the fill the papers of the inst-tuctive plaining of the fill the papers of the fill to what this gun, factory at Trith yearcolory, and the papers of the papers of the papers of the papers times the tritle of this it, specified, Large times and others over the fill year as for-cer mediatory, and of the papers when the papers of the papers of the papers of the papers annotate the papers of the papers o

LOOKING FOR PROFITABLE IRON IN ZHE JERSET MOUNTAINS.

His Orent Mill and His Monster Crusbers— The Iron Men May His Nehema Won't Work—That Proves the Importance of It, is His Answer to Their Objections. Anything which Thomas A. Edison is doing or trying to do is interesting and important, but, perhaps, of all the things which he has undertaken, the one of greatest importance to

Another which Themas A Zelona helders

Another which Themas A Zelona helders

Another which a second to the littles which he has

the posters of the things which he has

the homes cost is that which as is now hore.

The second to the second to the second to

the homes cost is that which as is now hore.

The day there have been dependent of the theory

that a local term of the second to the second to

the day of the second to the states cost of

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the second to the second to the second to

the se

Seattle and the seattle and th backs, and the from was sent to market in the same way. That big chain was forced link by

N.Y. World July 22

OUR FOREMOST ELECTRICIAN.

The Wonderful Discoveries and Daring Theories of Nikola Tesla, as Told by Him to The World.

GREATER EVEN THAN EDISON

Hard at Work Experimenting with a New Kind of Light and Promises Wenders That Are New Undreamed Of by Scientists.

Province of parameters in 2004 to the contract of THE ELECTRICITY OF THE FUTURE.

He Predicts It Will Be the Great Labor Saver-Picturesque Personality of a Man Who Is Toying with the Secrets of the Universe.

There is a small country in Europe called Lika, and in that country there is a village of forty houses, called 

A compared to the compared to

ment the thinnest and certably the near serious man who give to Delimonico's serious man who give to Delimonico's serious man who was the serious and the first test of the serious and the serious the has give at very far back in his bead. They was the serious the serious his bow he could have such Right the ser-let was the serious and the serious and the wave once much darker, but that taken he mind a grace (deal had, made he wave once much darker, but that taken he mind a grace (deal had, made less wave once much darker, but that taken he mind a grace (deal had, made less wave once much the serious that the result of the serious that the serious that you was the serious that the serious that the result is the serious that the serious that the result is the serious that the serious that the result is the serious that the serious that the result is the serious that the serious that the serious that was the serious that the serious that the serious that the result is the serious that the serious that the serious that the result is the serious that the serious that the serious that the result is the serious that the serious that the serious that the result is the serious that the serious that the serious that the result is the serious that the serious that the serious that the result is the serious that the serio

118

120

He is very this, is more than isk feet-tall and weighs less than a hundred and forty pounds. He has very big hands, lainly, able men do—Lincoln is one in-plance. His thumbs are remarkably big, even for such big hands. They are ex-traordinatily big. This is a good sign. The thumb is the intellectual part of the hand. The ages have very small thumbs. Study them and you will no-

Total Marie

The thumb in the intellectual part of thombies. Birthy them one you will not thombie. Birthy them one you will not them to the thin the thin the thin the Nikak Tella has a best thin preside est at the gibt of a new Hill bell of the thin the thin the thin the thin the planted as an becolds. His much is a set across expended the thin the thin the is not strong employed. He will be the act of the thin the thin the thin the act of the thin the thin the thin the act of the thin the thin the thin the act of the thin the thin the thin the act of the thin the thin the thin the act of the thin the thin the thin the designation of the thin the thin the thin of the thin the thin the thin the thin the samely near with more as a second later.

Jers from may of the mrn who are writ-ren and talked about in the fact that his has something to tell.

WONDERS OF THE FLY.

It is most pleasing to hear this wise man talk about figures that tire the supul brain. Mr. Delmonico and an aged classic basels. Not referred was the new first and the second of the sec

forehead worriedly, for it was a hot night.

"And that is nothing, from the ordinary point of view," mused the distinguished Mr. Tesls. "You see, if you

exertion in this weather," and wearily mopped himself out of the place.



NIKOLA TESLA

When 'ha 'signd' man bud sond Mc. Resh and he could go to siesp industing on the water, and Mr. Delimento, who pointed hinds based, and that he did not believe abusine ever act any one up-pointed hinds beard, and that he did not believe abusine ever act any one up-pointed hinds beard, and that he did not believe abusine ever act any one up-lies lower Daumbe place sometimes had select uses and dragged them beened long, and became so dangerous that awrimming about there was prevented, long, and became so dangerous that awrimming about there was prevented harmon springs, and started for the Springs at once. In the second of the second upper travelse, such their lattled, at my urgent requires, shoul descriptively and the When the aged man had gone Mr.

Mr. Nikola Tesla then talked, at my ingent request, about electricity and the timings that he hopes to do. the state of th

THE ATT STATE OF THE AT

In ordinary life our minds do not deal with the figures that come up in such in-vestigations, but take a £ and put after it fearten zeroes then you will have the number of vibratiess which occur in the either every second and which produce light."

Theoried out Mr. Tesa's suggestion, with the following result—600,000,000,000,000.

"All I have to do" and Mr. Testa." To deplicate the smallight in so art that will be a smallight in the second of the state of the stat

was such as the control of the barry was such as the control of th

such that a state of the state

simply from the above the complete tensor of the principles of the complete tensor of the principles of the complete tensor of the true great principles of the complete tensor of the true great principles of the complete tensor of the true great principles of the complete tensor of the true great principles of the complete tensor of the true great principles of the complete tensor of the true great principles of the complete tensor of the true great principles of the complete tensor of the true great principles of the complete tensor of the comp

### 5AY, JULY 22, 1804.

if applied continuously, it would simply

MLECTRICITY OF THE PUTURE When Mr. Tesia talks about the ele when Mr. Tesia talks shout the elec-trical problems upon which he is really working he becomes a most fastinating person. Not a single word that he says can be understood. He divides that up into billionths of seconds, and supplies, power enough from nothing apparentlyhower enough from nothing apparently to do all the work in the United States, lie believes that electricity will solve the labor problem. That is something for Mr. Debs to ponder while he lan-guishes in his dungeon. It is certain, according to Mr. Tesla's theories, that the hard work of the future will be the the hard work of the future will be the pressing of electric buttons. A few's centuries from now the criminal instead of working a treadmill or picking seaum will be sentenced to press fiften elec-tric buttons every cay. His tellows, long tric buttons every oay. His tellows, long since dissued to work, will look uppan his toll with pity and horror.

Mr. Nikola Tysla is to be envice. He owns one of those rare minds which do not absorb trivialities. A computation of the vibrations of a five using is to him what croquet would be to Grover Clerciapd—It is play. He can Horwhom he windsite, but he decent to a life.

Chresipped: It a glay. He can stay way of the control of the contr

tra door not believe in telepi He does not believe in Melapathy, which is, according to its exponents, a sort of psychical electricity enabling one mind to communicate ideas to another without words. He considers that what, is usually taken as an ovidence of the existence of telepathy is mere coincidence. But the working of the human mind through observation and reason interests and amazes him, as it

reason interests and amazes nim, as it well may.
"Suppose I made up my mind to murder-you," he said, "in a second you would know it. Now, isn't that wenderful? By what process does the mind get at all this?" One wise man whom I knew used t

One wise man whom I knew used to my that the scientiats with their jumble of laws governing the universe were ignoramused, and that there weren't more than half a dozen fundamental laws all told. I asked Mr. Teala what he thought about that.

"I think," said he, "that they could all be reduced to one." ARTHUR BRISBANE.

### 3178

CARBORUNDUM.
The John Scott Legacy Medal has been awarded by the Franklin Institute of Philatelphia, to the inventor Edward Gacheson of this material which is an artificial abrasive of very high power.

It is, in brief, as an abrasive material.

ti is, in brief, as an abrasive materiat, of for grinding and polishing metals, glass and precious stones, that carborundum has been found to possess decided merits; and been found to possess decided merits; and been found to possess decided merits; and when its unique physical characteristics are, so thoroughly understood that they may be utilized to the best advantage, the material, in all probability, will mak among the most valuable abrastves known to the arts. It was first usefully applied for cutting and polishing of diamonds and other precious stones, and from reliable evidence presented in the course of this investigation, its cut-

ones, and from remains evaluence presented in the course of this investigation, its cut-ting qualities will bear comparison with those of diamond dust. It is reported to be

the generation of the second o and points for use in dentistry in place of the dum tools in general use, and finally, it has been introduced in the market in the form of wheels of large size for general grinding and cutting purposes in machine work as a substi-tute for emery wheels.

CORBETT BEFORE THE KINETOSCOPE. The Champion Knocks "Pete" Courincy Out and Earns \$5,000. 248

of Erras \$5,000.

O II B IF 77. champless
posities of the world.

It is a fine world.

It is a fine world.

It is a fine yearder,
with four source please,
tor, is West Crange,
N. 74. with "Visite
tor, in the world was a
readed by the Mississes
order to Source was arcased by the Mississes. Ny Herata no stonita ngo rand between affectory, scople Company, in order to get a perfect series of records of a gendino fight. It will be remembered that similar exhibition was

whether the property of the pr

122

magnetic field to a their which may be bare they are all properties of the control of the contro

seals, with 100 Me Total Control of the country of

### DAY, JULY 22, 1894

if applied continuously, it would simply ELECTRICITY OF THE FUTURE laters per any.

White JAY: Two the train of the period of

"He "does "lin" (believe in "telepathy, which is, according to its exponents, a sort of psycholar destrictly enabling one winds to communicate ideas to the work of the communicate ideas to the winds its usually taken as an ordence of the existence of telepathy is more confedence. But the working of the human mind through observation and only the working of the working of the confedence. But the working of the human mind through observation as the working of the worki

reason interests and amount of the well may.

"Suppose I made up my mind to murder-yea," he said, "in a second you would know it. Now, isn't that wonderful?

By what process does the mind get at all this?"

all this?"
One vise man whom I knew used to
may that the scientists with their jumble
of laws governing the 'universe were
ignorumuses, and that 'there weren't
more than half a dosen fundamental
laws all told. I acked Mr. Tesla what
he thought about that.
"I think," said he, "that they could
all be reduced to one."

ARTHUR BRISBANE.

#### 3178

CARBORUNDUM.
The John Scott Legacy Medal has been awarded by the Franklin Institute of Philadelphia, to the inventor Edward Gacheson of this material which is an artificial abrasive of war, the course

this material which is an artificial abrasive of very high power.

It is, in brief, as an abrasive material, of for grinding and polishing metals, glass and precious stones, that carbornudum has been found to possess decided morits; and when its notice a their distribution of the property of the prope been found to possess decided motifs; and when its unique physical characteristics are so thoroughly undentood that they may be so thoroughly undentood that they may be in all probability, will make not material, it all probability, will make not turn the was first usefully applied for cutting and was first usefully applied for cutting and salones, and from reliabs and other precious in the course of this investigation, its cut-ting qualities will bear comparison with lines of diamond dust. It is reported to be those of diamond dust. It is reported to be

specially useful for polishing such gems, and some of the members of the suc-commutee scharged with this investigation, having tested the merits of the material on various gems,

Althe merits of the material on various gems, reports very favorably upon it.

It is used in considerable quantity in the grinding of the glass sloppers and bulbs of the new Westinghouse electric incandescent lamps for which service it answers very satisfactority.

It is found very efficient in certain finishing operations in machine work, as, for example, for brass valve grinding. Of late, it has been introduced in the form of small wheels, disks, and points for use in dentistry in place of the corundum tools in general use, and finally, it has been introduced in the market in the form wheels of large size for general grinding and cutting purposes in machine work as a substitute for emery wheels

122-CORBETT BEFORE THE KINETOSCOPE. The Champion Knocks "Pate" Courtney Out and Earns &B. nno and Earns \$8,000.

I B IT T. chammelon pugilles of the worte, fought a skr round hattie to a flash yesterday with four source gloves, the four sources of the four sources of the four sources, the children was arranged by the Kineto-copic Comprany, in order to get a perfect

The Theorem was to be a second to be

## RED MEN AGAIN CONQUERED.

Easily Subdued Before the Rapid Fire NY of the Kinetoscope at Edi-Hevald Sep 25 1894

MORE EFFECTIVE THAN QUNPOWDER. Holy Bear, of an Investigating Turn,

Became Unwittingly Attached to a Live Wire.

WONDER OF THE SAVAGES.

A party of Indians in full war paint invaded the Ridson inberatory at West Orange yester-day and faced undinchingly the overing rapid fire of the kinstegraph. It was indeed a mom-orable engagement, no less so than the battic of Wounded Knee, still fresh in the minds of the warriers.

carbin engagement, as here is thefold a mention of the window for the work of the control of the

3181

### NY 500 3182 NY 500 306 12 1894

CORDETT MAY BE INDICTED.

GOORDET MAY DE ENDOCEME.

SANTE PRESS PRESSE AN EMPLY FAIR OF THE MANUEL PRESS PRESSE AND PRESS PRESSE AND PRESS P

would in the most good.

In the sixth resust Corbett went right to work and in a very four mements Courtney was down and makble to rise.

I The fight lasted just six minutes, not counting

### 3183

NEW DUILDING FOR GENERAL PLEATING.

Schemester, N. T., Nov. 4-706 undelty M has

Schemester, N. T., Nov. 4-706 undelty M has

schemester in the schemester of the schemester of the schemester has been designed to the schemester has been designed by the schemester of the schemester o

AY Herald Oct 30 1894 3184

Dr. Eugeno Crowell died early yesterday morning in his apartments in the Hoffman Arms, Fifty-ninth street and Madison avenue, where he had lain ill since October 1. It had



Dis. SPURNE, CROWELLsketch of his life over periods, that the end was
fast approaching. It came at fire o'cleck in the
morning of the control of the control of the
morning of the control
morning of the
morning
mornin
morning
morning
morning
morning
morning
morning
morning
morning

3185

12,5

## SMYRNA & CASSABA RAILWAY.

FÊTE OF

## THE 50 MAY 1893.

Of all the fêtes celebrated in this very interesting part of Asia-Minor, that of Pergamos is the oldest, the finest and the one that offers the most attractions to the public, as it also affords an op-portunity of visiting the ruins and antiquities of the ancient city of Pergamos.

3186



### BIPY DANCING FOR THE KINETOGRAPH. A Party of the Gavety Girls Visit Edison's

A Parly of the 'Bayety Uris' Visit Edisors'
The 'Laboralory all Orange,
The 'Laboralory all Orange all Orange,
The 'Laboralory all Orange all

### 3188

Mr. Stevens and the Yogt Miracles.
Thomas Stevens, who has much to recomes Stevens, who has much to recomes the trip to India, told an audience
pt, he Pith Avenue Theatre inst night
something about the miracles he had witsomething about the miracles had witmer and the surface of the country an
external by the Yogt.

H. sall key about the miracles than

MR. JOHN WALTER DEAD.

MR. JOHN WALTER DEAD.

1a Chief Proprietor of the sound Jimes Carter, Alex ... undon Jimes del codesty.

1a Wals THE GALNESS OF THE POUNDER OF THE DEAL THE CARTER TENDERS THE APPLIED AND THE DEAL THE CARTER TENDERS THE APPLIED AND THE DEAL THE CARTER THE ADMINISTRATION OF THE PROPRIET ENGAGES THE APPLIED AND THE CARTER THE ADMINISTRATION OF THE APPLIED AND THE ADMINISTRATION OF THE ADMINISTRATI



- MeV , about 7 - 1894 The injunction which was served last week The balancies which was served hast week upon the Wantighoos Discertic faight and Manifesturing Company atopped its removal of the Manifesturing Company atopped its removal of the Manifesturing Company at 10 per acres, in classification of the Company and the Company at 10 per acres of the special content of a director of the Company at 10 per acres of the Company at 10

The property directly concerned was owned;

COUNT PERDINAND DE LESSEPS

3193

THE HISTORY OF A CRIME NYTTIBURE - ADT. 9 19

THE THIEF AND HIS MASTER. / 7

On December 21, 1891, Issue: H. Maynards
by Baviol B. Hill's orders, stole the true
slection return from the XVth Senate Disriet: which resulted in making the Senate Demeratic by fraud. DEWARDING THE THEFE

On January 19, 1822, Governor Plower, by David B. Hill's orders, rewarded Maymard by appointing him to a place on the bench of the Court of Appeals; and on December 34, 1862, reappointed him to that place.

INDICTMENT OF THE THIEF BY A DEM-OCRATIC JURY.

OGRATIC JULY.

On Mercil, El, 11th, the PLA-Association of Nemperiod of the production of Nemperiod of the most confirms members of the light
printing the most confirms members of the light
printing the most confirms of the light
formation of the light printing of the fact that
have been predictable of the fact that
have been predictable of the light
formation of the light printing of the fact that
have been predictable of the strength of the
have been predictable of the fact that
have been predictable of the strength of the
have been predictable of the strength of
the most printing of the light printing of the
article makes final densideration, he now account
after makes final densideration, he now account
and the printing of the light printing of the light printing of the

LEDINGENERY, ELDINGENERY, ELDINGENER

JUDOMENT UPON THE AGENT. November 7, 1833, Isaac H. Maynard, the of Buyld B. Hill in the theft of a le, was a enndidate for election to the Court ppeats, and was benten by 101,064

THE FINAL VERDICT OF THE PEOPLE ON

THE PRINCIPAL.
On November 6, 1394, the people of the State of New-York defeated, republished und condemned David B. Hill by 130,000 potes.

FIHADELATHA AND NEW YORK

THE COPARTNERSHIP HARE AND THE COPARTNERSHIP HARE AND THE COPARTNERSHIP HARE AND THE COPART AND THE

3195 SATULLI'S NEW SECRETARY

ASIGULTS MEW SUMERAUT.
This Rev. Dr. Foderick Booker Said To Hero
Been Appointed to Succept Dr. Pagl.
It was shaped to Succept Dr. Pagl.
It was shaped to the the Rev. Dr.
Prederich Booker, via graph of the College is Booker, who have been produced accordance to the College in Booker, who have been produced to the College in Enough has been produced to the Dr. Illector lugh, who is to peccond the Rev. Dr. Hector lugh, who is to peccond.
Dr. Hoster is a son of Myren II, Rocker, of

QUESTION EDISON'S PATENT.

128

Heraes

3194

to Restrain the Sale of His Sec 22 Phonograph. 1994

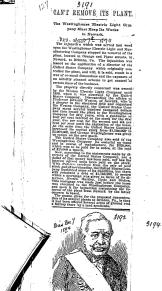
Accounts of a sensition for a sectionary injunction against Correction Window, who are
junction against Correction Window, who are
junction against Correction Window, who
are the sensition of the sensition of

THE NON-INFRINGING LAMP OF THE PENNSYL-VANIA ELECTRICAL ENGINEERING CO.



ANOTHER NON-INFRINGING LAMP.

Engineering Company, Penni Mutual Building. This lamp differs from that herstofters manufacture pany in that the "receiver" is not made entirely bence does not come under the circ.



COUNT FERDINAND DE LESSEPS

3193 THE HISTORY OF A CRIME NYTHING THE THIEF AND HIS MASTER. On December 22, 1881, I same II. Maynards by Baytid B. Hill's orders, stole the tene election return from the XVth Senate District; which resulted in making the Senate Democratic by fraud.

REWARDING THE THIEF. On January 18, 1832, Governor Plower, by David B. Hill's orders, rewarded Muy-nard by appliting him to a place on the bench of the Court of Appenis; and on December 29, 1854, reappointed him to that place.

INDICTMENT OF THE THIEF BY A DEM-

OGNATIC JURY,

On Marchi S. 172, the Jury Association of Neuprising the most embrane members of the legal
partial pa OCRATIC JURY. the full responsibility for his action,

JUDGMENT- UPON THE AGENT.

On November 7, 1863, Issae H. Maynard, the tool of Braviol B. Bill in the theft of a State, was a candidate for election to the Court of Appenis, and was benten by 101,064 votes. THE FINAL VERDICT OF THE PEOPLE ON

THE PRINCIPAL. On November 6, 1894, the people of the State of New-York defented, repudlated and condemned David D. Eill by 140,000 poice.

31 BOULDWARD HAUSSMANN, PARIS, Mr. St. 1801, Practic descriptors existing under OURLING, HALLING & IN. will be its date, by the undersigned, under GAN, HARDES & CO., DECEMBER & CO., DESCRIP & GRADES, DELAN D. SERVED. DELAN D. SERVED.

3195 SATOLLES NEW SECRETARY. The Rev. Dr. Frederick Rooker Said To Have ine itee. Dr. Frederick Rooker Said 76 Mays Boom Appointed to Succeeded Dr. Fagl.

Boom Appointed to Succeeded Dr. Fagl.

Presiderick Rooker, viter rector of the American Confess in Rome, has been apposinted secretary.

Confess in Rome, has been apposinted secretary, the Dr. Scott Dr. Bretter Prop., who is to become a coop that Born Licera Prop., who is to become a remail.

Dr. Rooker is a near of Styron II, Rooker, et

3196



128

See 22 Phonograph. 1894 Arguments on a soulse for a predistriary in-junction against Circumst Wesleys, who is at punction against Circumst Wesleys, who is at rappin on the matter for practical purposes, were leaved by Josep Leavenhe in the United Section of the Company of the Company of the Company part of the Company of the Co

edics of U. A. are sen Shauer namice in 200 March is probably at the pecuait time \$40,000. Since he probably at the pecuaity he hadarry herophysical to the photograph headarry herophysical the country, so that the adjustment of the "Mestor of the "Mestor of the "Mestor of the "Mestor of the probably and will sent the country of the probably of the

and a challenge with a factor at each cast a state when the control of the challenge of the

3198



The New Manhattan Athletic Club 1.5th Street and Madison Are.

requests the pleasure of requests the pleasure of Markets Batchelore Company at the Opening Reception on Saturday ovening the fifteenth of December.

Eighteen hundred G ninety four, at half past eight orlock.

Bell, Telephone Month Bee 19

for manager to the product of the process of the pr

self-carry to those cause as ever made in the self-carry. The decident was a surprise in the store; and The decident was a surprise in the store, and the stork responded sharply to the advers reining. A few honders care had said store in the store, and they were stored to the store of the s

CABIN PASSENGER LIST

"The patent of their is for a transmitter for



THE WHIRLPOOL RAPIDS AT NIAGARA FROM THE CANTILEVER BRIDGE OF THE MICHIGAN CENTRAL

## LISTE DES PASSAGERS DE CABINE

# LA CHAMPAGNE "

### DU HAVRE POUR NEW-YORK

Le 1" Juillet 1893

M. Clius. Batchelor
Me Batchelor
Min E Batchelor
Min E. Batchelor
M. Bertin, Directour
M. Bertin, Directour des
Constructions navales
M. B. Batsson
M. F. M. Bacts
M. F. M. Bacon
M. J. Adlison Bowen
M. F. M. Bacon
M. J. Adlison Bowen
M. W. S. Cathwoll

M. J. Allison Bowen

M\*\* W. S. Caldwell
M. le B\* Cuellar
M. Joseph Clavel
M. A. Caldarel
M. O. Claribonnier
M. Cherillon
M. Green
M. M\*\* Crimin
M. M\*\* Crimin
M. M\*\* Crimin
M. Joseph Carlis
M. Cheney
M. G. Compayre

M. haulton
M. A. Diabouder
Mer bahander
Mer bahander
M. S. Breyfins
M. A. N. Extrard
Mer F. P. Effy
Former de Chambre
M. Eng. Freshle
M. Eng. Freshle
M. Eng. Freshle
M. Field, Conservateur des
Foods
H. Tathle Fournier
En

Femmo do chambre
M. Gorjus
M. Michel Grimaldi
M. Graussmann
M. Gautier

M. Hutchinson
M. Hutchinson
M. Hermann
M. Hermann
M. E. Hospiniler
M. E. Hospiniler
M. E. Hospiniler
M. Hoffmann ils
M. Hoffmann
M. Hayden
M. Harden
M. Kotnowski
M. Kitch
M. Kotnowski
M. Kitch
M. Kotnowski
M. Kitch
M. Kotnowski
M. Kitch
M. Kotnowski
M. Lierd
M. Lauriergui
M. Lauriergui
M. Lierd
M. Lauriergui
M. Lierd
M. Lauriergui
M. Lierd
M. L

Me Livermore
M. de Laurreppe
M. de Laurreppe
M. Mithelstie
M. Mithelstie
M. Mithelstie
M. Salmon

M. Saffar
M. P. I. Thierry
Mr. Tackerroit
M. Vilianora
M. Vilianora
M. Manurer
M. Bunrier vide
M. Vintifation
M. Horestoport Wheeler
Gramman
M. Berestoport Wheeler
Gramman
M. Berestoport Wheeler
Gramman
M. Berestoport Wheeler
Gramman
M. M. Weller
M. Th. Writing
M. Th. Writing
M. William
M. Willia

RÉCAPITULATION

Pousagers de 1º classe...

de 3º classe...

M. JAMURYMAN. Secreta Capitales M. J. GORIK.

Telal...

Telal...

IND. Migned – Horre.

DIAMBER DU PADDEBOT II LA CHAMPAGNE II LAURISTA, Commendation M. J. GORIK.

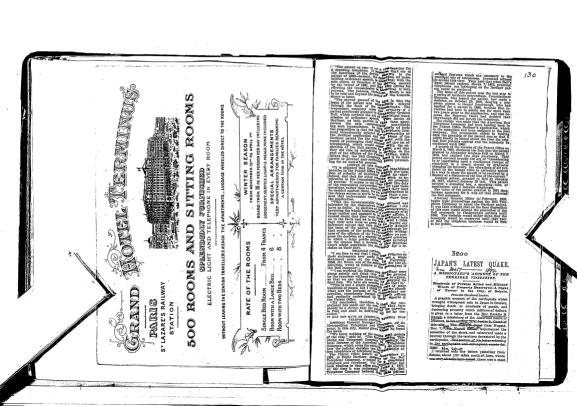
LAURISTA, C. III. LEGISTANII M. J. GORIK.

M. LAURISTA, III. Secreta Capitales M. J. GORIK.

M. LOURISTANII S. M. GORIKANII, J. S. GUILLIMBERGER

Commission, M. COMSTYANY Secretamination, M. GORIK, M. SECRETAMINATION, M. GORIGANII, M. SECRETAMINATION, M. GORIGANII M. DE VALCOURT

At the time it was indestigated that the Balling Telephone Company believed that the plant.



directions on physicals associated when the P. M. of the Conference of the March 1992 and the March 1992 and

The state of the s

From the Price of the Price of

Next we came too little country village, when can corny those was down, pleast-form; 1. The country village, pleast-form; 1. The country village is a second village of the country village of the distribution, off to corny dispose of the distribution, of the corny dispose of the distribution, was the village dispose were killed. Next we passed Nutries, copie were killed. Next we passed Nutries, copie were killed. Next we passed not be compared to the distribution of the country of t

à large piece of geligerend benis which was treased. He was network reproduct at the treased. He was network reproduct at the large production of the production of the large production of the production of the street blocks, and here securing the whole after the production of the production of the street production of the and perform order their mediations of which and production of the production of the properties of the production of the production of the production of properties the production of the production of the production of production of

and private cody, their anticorest over the series of the property of the prop

3201

## HER EYE SHOWS

HER MURDERER.
Herad Sec. 21 1894.
Microscopic Examination Reveals
a Picture of the Slayer of
Mrs, Shearman.

HIS FACE NOT APPARENT.

Coroner, Clergyman and Others Saw the Startling Photograph Found in the Eye.

TO FOLLOW UP THE CLEW.

INT TREATMENT TO, THE HERLID,
JAMESTOWN, N. Y., Dec. 20, 1881—Uscore
Bowers, accompanied by Fred S. Marris, a local
scientist, this morning wont to the residence of
Winstown Scientism, where J. Mr. Shartman,
how dample of the property of the State of the
how dample of the property of the property of the
misrovicepie estimated on the eyes of the speed

woman.

Nothing was reveated in the eres of Mrs. Sharman the form of a mm was distinctly photographed. The microscopi untel energed the object viewed four hundred times its real size.

and norm make his Vice.

The picture of the second did not been the face of the sace who is supposed to be the marrierer. The numb position was such according to those and the second did not been th

to read the state of the state

The Common engaged it. In Freddith, a photogram of the property of the sevents a manife active state of the sevents a manife active state of the sevents and the sevents and the sevents and the sevents of the sevents

The members were more three beings possible of the control of the control of the The below of the Control of the control of the other position of the control of the control of the other position of the control of the control of the other position of the control of the control of the other position of the control of th

7700

### Charles Batchelor Scrapbook, Cat. 1246

This scrapbook covers the period 1892-1900, with one additional item from 1909, and contains clippings about a variety of subjects. Included are newspaper interviews and profiles of Edison and his son, Thomas A. Edison, Jr. There are also clippings about Edison's kinetoscope and his plans for combining that invention with the phonograph; litigation involving Edison and the North American Phonograph Co.: Edison's relations with the General Electric Co.; and his iron ore concentration plant at Ogden, New Jersey. Other items pertain to aerial navigation; bicycles and the invention of the bicycle speedometer; x-ray experiments; and new uses for the automobile. Additional clippings relate to Nikola Tesla; the accidental death by electrocution of Franklin L. Pope, inventor and editor of The Telegrapher, the international competition for the "world's fastest train"; and organizational changes at Drevel Morgan & Co. Also included are advertisements from incandescent lamp manufacturers; passenger lists from transatlantic crossings; and invitations to meetings of professional societies and to social events The spine is labeled "1895-1896" and "H 3204 to ..." The pages are unnumbered. Approximately 150 pages have been used. The clippings are individually numbered 3203-3539

14 Plying Machine - Laughey's

THE RESERVE OF THE PARTY OF THE

A major designation of the control o

FIRST TOTAL IN THE INCLUDE.

THE first public mention of the new and successful derive was the account of fast week's rital which appeared excludively in last Sunday's HIRALIA. That account, also for the first fianc, ande known the interesting field work which has been quietty in progress for months from the successful for the first public death of the first public death and the fixed from Washington.

First miles down the Fusionare from Washington.

NY Herat) Sec 14 (894

The control of the co

His Present Operations.

The Prevent Operations:

The Prevent Operations of the Prevent of

Began as, Parm Boy,

Direct on A. Partin Inty.

This state of states to of more overy to the state of states and the state of the

There were two years in which lie was written over the thinderpress that is of the work of

ville. Pa., consented to take the youngster as

The control of the co joiner. This sort of work pleased him until be be-

The First Great Invasions. This was the second of the first investions. This was the second of the first investions of the first investion of the first investion of the first investigation of the first investig His Pirst Great Invention.

From the Top of the Tidal Wavd of Prosperity He Ist Reduced to Dire Po.

## ELISHA GRAY LIVES

Tau 30 1898 -IN-POVERTY AND WANT.

-HE INVENTED THE TELEPHONE .-

Character Study of a His Brain Has Made Remarkable Man.

Twenty Million~ naires

HE IS A PESSIMIST AT SIXTY-THREE.

At the age of sixty-three the inventor of the telephone, the man whose name should be as familiar as are those of Ellison and Tesla, is living in actual want out In Illinois. This is Professor Elisha Gray, who has made millions for others. He has had his ups and downs, but he never realized the value of money. Others have stolen the products of his brain and have amassed fortunes. But the old man still plods along, and is even now working upon an invention the development of which capitalists are watching with vulturelike eigerness. As a character study Professor



INDEPENDING TILBUT THIS THE LIP DOWNLOAD FOR THE LIP OF THE LIP OF

Professor, Gray, incred totalist, as usual road, the control of the compact, the relationst the last compact, the relationst two the last compact, the relationst two controls the controls of the control of the contro

the metric of the quoted intermediate he was a character of the control of the co

get it for a song were hard up.

Is Now a Pessimist.

will be the common and the common an

3204

3200

Wings have been treed for acceptants muon during several hundred years, as shown by the inclinents researches of Mr. Chamite, and that characteristic can be observed in redshifted the contraction of the characteristic can be observed in redshifted the contract abover their large been under which applies within Theorem abover their large been under with fings, but the contract and the contract that the contract contract and the contract that the contract that is a second of the contract that the contract that the contract the contract that the contract the contract that the contract

3206

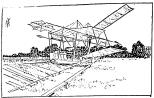
Mount . Un lokar Betchel .

a Stockholder, to Station of the Edison Eductric Sight Company, 908 Junson Street.

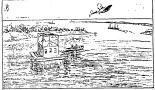
Win. D. Marks,

Nit Tourfeutte.

Jan 1895



THE MAXIM FLYING MACHINE, WOO #13



LANGLEY'S FLYING MACHINE.

3207 EXPLODED LIKE POWDER.

> ignition of Pine Pur Dust That Filled the Factory Building with a Man

719 19 119 of Flame. The factory of the New York For Cutting Company, No. 124 to 170 Meeker arenue, Will-lameburg, was destroyed by fire last night, and several diverse narrowly escaped death. The

320B CHANGES IN A

GREAT FIRM.

The Title of Drexel, Morgan & Co. Will Disappear on January 1.

PARIS HOUSE ALSO CHANGED. Something About the Distinguished

Reorganizer of Bankrupt Railroad Properties.

REFECT ON STOCK MARKET, Deel by Hype 12 to 18 to

London Even. J. a. Jouenne was unchanged.
The item of Drexel, Harjes & Co., of Paris, will be changed to Morgan, 'Harjes & Co. Mr. Morgan will still relain his interest in the dea of Drexel & Co., of Philadelphia, which will continue under its present title.

The common impression yesterday was that the first expired by limitation on January 1 ment, but Mr. O. S. Rowbolin sow of the firm, said last slight that the firm really expired by limitation to years ago, II has continued, however, without any formal renoval, he said, where that time. Mr. Howdain did not care to discuss the return plans of the firm or the re-

store that them. Mr. Howden's thin the care to protect change, and the care to prove the care to prove

3209

ail Feli as Large as Guineas' Eggs and the

### CUTTING COMPROMISE.

Torms of the Agreement Under Which There Will Be No Contest

of the Will Heraid

Fig. 1 [Max.]

The property of the property of

thin the own of SNATE is in the dependent with the Paramet's limit and proposed to seem because of the parameter of the param

not be nucleased or transactive, no use properties to any other previous. But the number of the beautiful properties of the consequence of the con

### 3211

#### THE OHNESORGE TELEPHONE.

Herr W. Ohnesorge, of Frankfort, Germany, has brought out a telephone presenting some novel features. Telephones with wire cores have hitherto been distinguished for their precise working,



but have had the disaivantage of rendering sounds very faintly.
Her Dimesorpe discovered that if the spiral iron wire forming the
second is increased in a name ruption of reportion to the differcase in position. The servery is utilized in the instrument, of
which the annexed or taken from the London Retriction shows

which the annuced c taken from the London Reterition shows the Actuals, the Actuals, and the Actuals, the Actuals, the Actuals, the Actuals, and the Actual the Actua

### 32/2

### DISPOSED OF A MILLION.

Egisto Paolo Fabbri Made Charitable Br quals and Divided His Property Among His Helatives, Friends and Servants.

Helas)
Firster the provisions of the wife and castlell of Exister Paoin Publish new on the in the office of the Surveyorts research property in this State. Heines I clearly the problems of the well year old full me the second of the well of the second of the well of the second and the second s

### 3216 4

## A FIND OF BARE POSTAGE STAMPS.

A PARD OF LAKE FORTAGE STAIRS.

From The Lackod Globs. "I, I, I of the local was for politicalist received as even to the lack of the local was for politicalist received as even the lack of the lack

### 32/3

### SHOWING THE BIG MAGNET.

Civil Engineers and Their Priends Entertained by Army Officers at

tained by Armiy-Officers at Willots Polint.

\*\*Heath Journal For Honor American Seciety of Civil Engineers, with their wives and friends, arrived at Willets Point on the sciencer Som Sions at noon pretenting and spent several hours as guests of Colonel Will-

account with make the principle was the Milke at commendant of the United States Has Nine. commendant of the United States Has Nine. commendant of the United States Has Nine. Commendant were then on the property of the Nine States of the Nin

### 3215 K Old Stomps Tel 1895

Very high prices, in numerous shahilpitet on record, were chained for postings stampas in event fundaments. According on the postings at a recent fundaments. According to grant of the contraction of the

#### 3214 ELECTRIC COMPANIES COMBINE.

## Concerns Have Pooled Are Generally Believed.

Cascarra Hara Papila des Gascardh Sellevet, Verlingheurs and Horsen Eerste companies, which has been current in Wall street for the New York of the Cascard Eerste Cascard

### 3214

### THE HERALD'S PRIZE OFFER. Sixteen Thousand Deliars To Be Awarded to

American Novelists and Poets. The New York Henand will award a prize of \$10,000 for the best serial story of between 50,000 and 75,000 words by an American writer, whether professional or nunteur. The condi-

tions of this contest are as follows:--The manuscripts must be submitted anonymously, and must bear only the initials of their authors or other private identification marks, so that the Mantity of the welter will not be brown to the committee of three examiners, who will be appointed by the HERALIS, and who will select three stories of the greatest merit.

The stories, so selected, will be printed in the HERAID, daily and Sunday, as secusion requires,

beginning early in October, 1805, The replets of the threath will be a decided to decble, by ballot, which story they like best, and the prize of \$10,000 will be awarded a cordingly, The manuscripts, other than the three selected by the examiners, will be returned to the writers, upon their identification by means of their initials or private marks. The writers will be at liberty to publish these returned manuscripts elsewhere, and no reference will be made by the HERALD that they have been rejected,

All manuscripts for this competition must be submitted before July 1, 1806.

The Henry also offers three other pricesthe first of \$3,000 for the best novelette of between 15,000 and 25,000 words; the second, a prize of \$2,000 for the best short story of between 0.000 and 10000 words, and the third, a prize of \$1,000 for the best spic poem, based on some event of American history that has securred since the beginning of the War of the Revolution.

The conditions that will govern the competition for the prize of \$10,000 will also govern those for the prizes of \$3,000, \$2,000 and \$1,00). The chosen manuscripts will be published in the Hypertay in turn, when the concludes of the serials.

All manuscripts for these latter competitions must be submitted to the HERALD before September 1, 1895.

Manuscripts should be addressed as follows: -For the \$10,000 prize, Serial Story Competition, The New York HERALD; for the \$3,000 prize, Novelette Competition, The NEW YORK HERALD; for the \$2,000 prize, Short Story Competition, The New York Henald; for the \$1,000 prize, Epic Porm Competition, The New York

### 3215

From The Leadin Bernstein, Jan 1985 187. The Tree Tree Leadin Bernstein, Jan 1985 187. The Leading Lea A TANKARD WITH A HISTORY.

JAMES U. MAC KENZIE. By W. J. HAMMER.



James U. Mac Kenzle

The many friends of Mr. James U. Mac Kenzie will regret to learn of his recent ideath from para-lysis of the brain and leart failure. Mr. Mac Kenzie was barn in Inver-Kende was born in Inver-ners, Scotland, on the 12th of March, 1837, re-moving with his family to America at the age of nine years. The early portion of his life was spent at Niagara Falls. He was connected for the was connected for oighteen years with the Grand Truck Railway, and it was during this period that he made the acquaintance of Mr. Thomas A. Edison, who has been his life long friend. During the time Mr. Mac Kenzie was stationed at Mr. Clemens, Michigan, where he occuried the maintenance of the control på-d the position of sta-tion master and telegraph operator. Edison, who was at that time a mere

hay, engoed in either grown and that there is more bely, engoed in either grown the first on the case, hand the last the case, and the last the case, and the last th

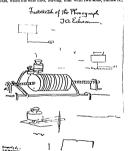
call friend Mr., if the Kurdic is two thirty, however man and a Mr. if the Grand Control of the Control of the

The law related Canada in the interest — the Edikon inconductors out obertic light and endowaved to require a company of a contribution of the conjectuals, among — «», of his made, Ser Bart of the conjectuals, among — «», of his made, Ser Bart of the Canada Can

with the Gamewell Fire Adarms and recognom-compact accounts of the compact to the contract of the compact contract of the contract contract of the contract contra

AL ENGINEER.

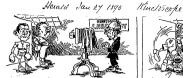
Min as also and bearty man, standing over six frest in height and weighting over two huntred pounds; for of them however know the falliests, and the second of the second



EDISON'S FIRST SKETCH OF THE PHONOGRAPH.

of Washington, and Alexander, of Brooklyn. He subsequently married Mrs. Bitabeth Campbell, nice McGregor of Detroit, Mich., who also had two children, a son and daughter, Robecca Pu John R., and to this family of four, were added another bearing the control of the control of

Herard Jan 24 1845



Professor Neddyson-Now, remember, gentlemen, we want a genuine fight hef-this kinetoscope, and when I say ready! let it go lively, and no monkey business



3220

4-Ranel Banel



2-Readyt Got Banet Rangi





s-nint Bant



Professor Neddyson-Beg pardon, gentlemen, but won't you do that last round

3221

Electrical World Fel 23 1896 THE LITE AND INVENTIONS OF THOMAS ALVA EDISON. By W. E. T. Dickson and Antonia Dickson. Boston: T. Y. Crowell & Co. 362

pages, 155 illustrations. Price \$4.50. A great deal of the material embedded in this book had previously A great deal of the material emocited in this book and previously appeared in a series of articles by the same authors in Cassier's and the Century Magazine, and with many additions and elaborations now forms a volume whose mechanical and typographical execution is worthy of a volume whose mechanical and typographical execution is worthy of the highest praise. The same, however, can hardly be said of the text, whether considered from a scientific, technical, or even literary point of view. The book is written in what might be called an exaggerated popubar style, abounding with the most enthusiastic expressions of praise and aumination of the subject, and consuming manetonic passages of flowery thetoric rather out of place in unfolding the biography of a great inventor. The authors appear to be entitlely carried away with great inventor. The number appears to be entirely carried away with their subject, having but one thought-Edison-and they put forth, with every possible verbal decoration their utmost efforts to induce the reader to join them in their conclusion-that Edison is "the greatest

reader to join them in their conclusion—that Edison is "the greatest geains of this on any other are," In the first part of the work we are made acquainted with the early life and unconventional experiences of Mr. Mision, many new and inter-esting incidents and anecdotes being recounted; although we are more of less familiar with a great deal of the matter, yet the collection of Edisonia here given is the most complete yet published, and should tentionia mere given is not most complete yet photisined, and should abundantly satisfy those who admire the Profissant and Weema style of biography. Gradually we are brought to the various changes in his life. hiography. Graumny we are unugan to the various enanges in his life; his personal qualities and indominable love for invention are enlarged mon, and his inventions described in their order, most attention being upon, and ma inventous scattered in over order, more memoral paid to the incondescent lamp, phonograph, and kinetograph. The de-scriptions of most of these, however, though adoned with most flower emprions of most of finest even in a popular scientific sense. Nearly two chapters are given to the phonograph, but very little is said as to

the principles embodied in its operation, and other inventions are treated in more or less the same manner. Several chapters are also de-voted to the expeditions made by Mr. Edison's accuts in the search for a suitable material from which to make the incondescent lamp filament. and other matter is treated at great length which has only a slight con

nection with the story.

The authors have in the preparation of the book had the personal assistance of Mr. Edison, who is frequently quoted, as are also many o assistance of Mr. Rélison, who is frequently quoted, as are also many of his assistants and associates. Infinitely knowing and being associated with the inventor for many years the authors have written as almstring friends and mr., therefore, he perhaps pardoxed for the vest amount of landstory enthusiasms which prevides the book, whose impira-tion, however, is certainly very credibilite to the subject. A book treat-ing of Rólison's eventful life in more solver terms and describing his numerous inventions in a sejentific manner still remains to be written. The present volume can only be considered as an elaborate and popular story written in a manner to exalt the popular sentiment according to which Edison and electricity are synonymous. As such it will serve its nurpose with the general public, and is superior to the several other biographics of Mr. Rdison which have made their appearance, surpassing them in completeness, while in mechanical execution there is no comparison. The glorified Edison we see through its pages, however, is not the keen and practical-minded inventor known to the electrical public, to whom, moreover, his inventions will scarcely be recognizable in the thetorical dress in which they are here presented.

The second of the control of the con

3222

Section 1 - Control of the Control o

3223

Section 1. The section of the sectio Total First night's sale. 423,783 Electricity,

The Bell Telephone Company shows the following figures from 1885 to 1894; Gapital. Dividends. Net income. Equals on stock & 9 Section 8 1,562,200 \$1.809.996.18 1886 9,502,100 1887 9,502,100 1888 9.952,100 1,568,336 1,568,336 1,568,336 1,789,878 \$1,973,350 48 1,973,350 76 2,237,608 12 2,136,463 56

1888 1880 1890 1891 1892 1893 11,3 (3,500 12,500,000 15,000,000 1 539 913 2,213,913 2,625,600 2,919,080 \*3,317,500

\$163,354 28 264 257 36 198,855 44 225, 25 13 207 520 66 257,401 55 281,854 88 20,8 21,35 26,72 22,95 20,85 19,49 2,661,888 69 2,869,11-35 3,126,819 80 3,111,679 78 8 97

Task. Average per your...\$1,200,005 [2,00,10] & Compute of Treasure Tasks W.f. Average per your...\$1,200,005 [2,00,10] & Compute of Treasure Tasks W.f. Average per your...\$1,200,005 [2,00,10] & Compute of Treasure Tasks W.f. Average per your...\$1,200,005 [2,00,10] & Compute of Treasure Tasks W.f. Average of Treasure Tasks W.f. Average of Tasks W.f. Average of Treasure Tasks W.f. Average of Tas

The Beecker, M. Addronderts, T. L. St. Victor in the Addronderts, T. L. M. St. Victor in the Company of the Company from Albano, 133, "Perfect of the Company from Albano, 133, Clouds, Miles, J. D. Cylindia.
 The Company of the Company from Albano, 133, Clouds, Miller, M. Ambrin, 133, Charles, Miller, M. Ambrin, 134, Physics and A. C. P. Charles, M. C. L. Charles,

The state of the s

Total. \$37,530
First night's sale. \$37,530
Second night's sale. \$3,543

Year's Par cont

\$163,354 28

1112

with left. with the superted here were he was with left. The superted here were a superted here were a superted here were the superted here. The superted here were the superted here were the superted here. The superted here were superted here.

Jessey of the part of the part

+ 3224

Fresta Heraed. Meh 14 1895

Utterly dislocationed and broken in spirit.
Nivola Tests, one of the world's greatest electicitians, roturned to his rooms in the (ferlach)
yearday meraling and took to his bed. He has
not arisen shore. He like there, half skeeping,
half waking. He is completely presentated,
in a shape halfs the fruits of ten years of toil In a single night the fruits of ten years of ton and research were succept away. The web of a thousand writes which at his bidding thritted with life halo been twisted by free into a tangled skeln. Marchine, to the perfection of which he are all that was heat of a master mind are now chappens things, and vessels which contained the state of the state of

pot sherds.

By the fire which swept through the building
at Nor. 31 and 33 South Fifth areans in the
early hears of yeatenlay morning one of the
most valuable inhoratories in the world was destroyed. It was that of Nicola Tesls, the Ser-

Moreof. It was that of Micola Teels, the Ser-tian electrician. In those upper lofts were operation appellance which means a revention in fectival science.

There were materials which he could shape to fetter the lightisting and to cell into action the meast saidle of force. Early and late he telled meast saidle of force. Early and stead to there. It was on the weo of making known oftenthe discourtes which would have solded

steers. But was on the own of making known of the course o

science.

Nicola Tesia came to this country about ten years and from Servin. He was twenty-serven years oil then, yet his name was afrendy one of the foremost in the world of electrical re-

Spring and them, red the names was afterday one secretic. See a time sensetical transverse to the sensetical transverse t

better, the nor proposed in marginal directly and the second of the seco

2425

Mch 1895 Last COINS AT AUCTION.

The following were the principal prices obtained at the Tachterman collection of coins, sold by Bangs & Co. yesterday:

stined at the Technicum solution of william and will be able to the technicum solution of the old by Blues & C. principally.

And of Physics & C. principally 200 p. c., for all the principal solutions are presented by the principal solution of the prin

Argon. \* 3226

EDISON HAS HIS EYE ON ARGON.

Com His HIS EYE ON ARGON.

Riscirlo Lumps Nhow that There's Bomething in Air Healdes Nitrogen and Oxygen. thing in Air Headers Nitrogen and Grygen. Thomas A. Eldson has recoilly been reading up on argon, the newly discovered gaseous constituent of the atmosphere, and on the experiments of Lord Hayleigh and others abroad. He said yesterday that he intended to do some experimenting himself as soon as he could get around to it. "That will probably not be before next aummer," he added, "as I am atill very bay with my unising operations. I do not know htsy with my mining operations. I do not know of any investigation into the nature of argon having been made in this country, but, doub-lets, experiments will soon be made all over the world. They will look for argon, and it is quite likely that in looking for it they will find other new elements in the atmosphere.
"The discovery of aroon is a fresh evidence of

mare discrete in the attemption. The region of the control of the

3227

THE NEW ELEMENT IN THE AIR.

Biscovery of Lord Hayleigh and Prot. Star. 192. The Hanney, 14.69 Act wasternove, March 22—1a Agent of last year Lord Rayleigh and Prof. Homes, announced to the Royal Bootely that they had discovered a new element in the six, and that acovered a new element in the six, and that the proper time, as our action would shad the continuous country time, as our action would not continuous cont

Postage Stamp Craze

A Bratisharon Coust, printing stating, Mark on harf, was add for hidd reversity in Loudon. Three It, I and the state of the printing hereal by the printing hereal hard printing hereal hard printing hereal hard printing hereal hard printing hard printing

ALC. 1895

# BELL'S GREAT RIVAL.

Enormous Capital and Political Influence Combined in a New Telephone Company.

### WILL COVER THE COUNTRY.

Three Hundred and Sixty Million Dollars Now Invested in the ON 5 Big Organization. 1895

PROMOTERS KEPT VERY QUIET.

Doubtful if Even the Bell Company Has Known What the Organizers Were Doing.

[BY TELEGRAPH TO THE HERALD.]
CHICAGO, III., April 4, 1833.—The fascel conhanthon of cupital and political influence ever gotten together has been organized to cater the telephone field and roat the Bell country by giving cheaper, and, it is declared, better telephones.

of positions, who mak among positions in the mass Called milk opposition in the Called milk of the Christon, of Inc. John W. Condier, of Rec. Milk of the Called milk of the C

conversation can easity be carried on between New York and San Francisco. Mother advantage calands for the climina-tion of latteries is that it reduces the size of the conversation of the conversation of the latter-us. This torrelies with the term of the latter-nical, which is all in one piece, transmitter and receiver, makes it practicals to piece it any-my on a book in the wall at any coavoning in the conversation of the conversation of the conversa-nce of the conversation of the conversation of the conversa-tion of the conversation of the conversa-

CHORDIAN, He whole being no longer than one's hand.

GEORGE CHOCKER SAIS THE WORK HAS BEEN ONING ON SINCH ISCH.

BUT TELEGRAPH TO THE HERALD,

SAN PRANCETO, Call, April 4, 1855.—George Crecker confirmed to-day the story of a power-fiel combination to compute with the Bell Techphone Company,

"I am not well posted on the details of the

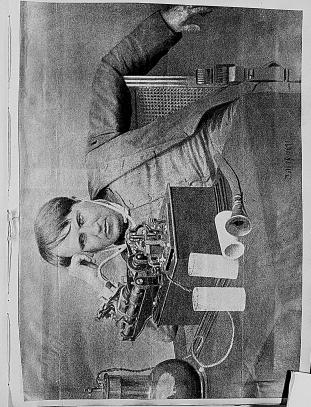
pinets university to the one that the charge of the access to the charge of the charge

## ELECTRICITY ON CANALS.

The Official Test of Propelling Boats by Lamb's Method an Unqualifled Success.

Of the second to the Beat of the Second to the Beat of The Second to the Beat of The Second to the S

miles long, erected on the worth able of the art of the control of



# LISTE DES PASSAGERS DE CABINE

32.32

ssagers de la classa . . .

de 2º ciasse......

do 2º ciaso como como

Embarqués sur le Распевот

# "LA CHAMPAGNE

## DU HAVRE POUR NEW-YORK

Le 4º Juillet 1893

M. char. Exteledor Sive Bachelor Sive Bachel	M. Toullon M. A. Toktocker M. A. Toktocker M. A. Toktocker M. S. Breyske M. A. S. Event M. S. Breyske M. A. S. Event M. Ford Conservation M. Garlier M. Morel Connelli M. Garlier M. A. Gortfrei M. M. Schleimer M. Steffen M. St	M. Hardeinson W. Bermann M. L. H. spatier M. H. Starter M. H. H. Spatier M. H. H. Spatier M. H. H. Spatier M. H. Start M. Karten M. Larit M. Martire M. Martire M. Hembelt Martin M. Martire M. Martire M. Martire Martin M. Martire M. Martire M. Martin M. Martire Martin M. Ma
RÉCAPITULATION	OFFICIERS DU PAQUEBO	OT " LA CHAMPAGNE "

M. JAGUENEAU, Second Capitaine

Commissaire, M. COMETTANT

1" Lieutenand

M. DANKÉ.

M. DAMPT.

LAURENT, communicant

Médecia, M. DE VALCOURT

M. LOGRE,

M. GERRY, M. SAQUZANET.

M. LE PINIEC,

Sous Commissaire, M. SCHLUMBERGER

### 3233 THE GOLDEN BUTTERFLY

An Important Mining Deal
Consummated. 1893'
Orovide Meleculy Mcd 25
The Morris Ravine Mine New Under

Control of English Capitalists.

Details of the Transfer Whereby Oreville Will Have One of the Largest Brift Mines in the State-Golden in Name and Golden in Reality.

A great mining deal has just become public, whereby the famous old Morris Ravine mining property, formerly owned by Secretary of State Hendricks, Thos. II. Hendricks, J.C. New and a company of Imliana capitalists, passes into the hands of a company of English mining men, having been floated in Lundon between

The old Morris Bavine mine, or, as it is now named, the Golden Butterfly, which was formerly worked by hydraulic poeces, consists of 1200 acres of patented land, and is probably the largest mining claim in the United States under one patent. It is situated about four miles above Corville, just where the ravine of the same name cuts between the north and gouth Table Mountain.

In the galary days of hybraulic units, Morris Ration was the seem of great activity. Through there in prehistoric days, are an nighty river, whistoric days, are an nighty river, which bearing grown for centuries, the rich poblesting gravels of the Sherras and depositing them in a channel of great width. There came a terrible upheaval of nature in which the less of the earth of the control of t

what stupenduous changes were effected. The hardy miners of early days found traces of this mighty channel and profeed greatly thereby, for the richest placers ever worked in the richest placers ever worked in the same old chanter of the richest placers are also as a second and were at Morris Ravine. Thousnole of men took out millions of dollars, until the time when the placer mining exhausted the surface, and the ora of hybraulic mining came.

After the Hendricks company acquired possession of this vast body of land, they spent between \$400,000 and \$50,000 to perfect the title, to build ditches and bring in a water supply that would be inchantatible and sufficient to mine the property by extensive hy-

draulic process.
The mine paid—paid almost fabsilossly, last misfortune seemed to follow the efforts of the Hendricks company. In its palmiest days, when its richness are just becoming known, a great silde of such stupendous nature, carried down a portion of the mountain, covered the pipe lines and sluices and there was not salideant water to pipe off the silde. Before arrangements for reopening could be made, came the dobris injunctions, followed by litigation, and on the death of both W. C. Hendricks and P. H. Hendricks, the property went to the creditors, the principal of whom was Senator Geo. C. Perkins.

The interests of the creditors were consolidated and placed in the charge of a Board of Trustees, who made the present deal with Major Frank Me-Laughlin, through their agent, Milton J. Green.

It may be stated in this connection, as showing the high standing with which Major MeLaughlin is held in which Major MeLaughlin in held in the dinament in the standard that in less their standard state of the Major MeLaughlin in less their standard matter the property passed much resident section, that he had flouted it in Lounder through his associates there, the content of the major ma

company.

Major McLaughlin's ability to open and work the unine successfully is due, in the main to his absolute control of the extensive water rights of that section, among which are the Miocase ditch and the Hendricks system of canals. Without these water rights the property would be valueless.

Columns of facts and figures night be quoted to prove the undoubted rickmess of the property. The richness of Morris akarine, which was fed by the old channel, is known to every early miner, that the most conclusive proof is in the latt the most conclusive proof is the property of the ground treat by the hydraulic processor of the property layer of the property of the property layer of the property of the property and the property of the prop

The Spring Valley lies to the north of the laxe capped Table Mountain, and where the channel was not protected by the great amount of gold law to the property of the property was mined by the largest hydrantic syswas mined by the largest hydrantic syswas mined by the playing out of the supporting gravel. To the south the supporting gravel. To the south the revisions of the channel undoubtetly fed

the placer diggings of Morris Ravine.

The plan of operations is to vegle the channel by a tunnel and open up the mine for drifting. What this means to labor may be arrived at when we say it that it was estimated by experts that the old Cherokee channel, if thoroughly opened by tunnel and worked by drift, it

3234

August 31, 1895 (37) Churchwan

Ax anction of stamps in London brought about \$8,000 in two days. Thirty doi: lars were paid for a real Bogglaid V, it stamp; \$500 for a real Bogglaid V, it stamp; \$500 for a Moldavian stamp of fifty four paras, blue on a green ground. An other Moldavian stamp of S. Spanish stamp of the stamps; \$100 for a Moldavian stamp of the parasity of the paras

would give employment to 500 picks. The Golden Butterfly will do as much, if not more.

The actual work on this new and lunportant enterprise commenses today. For this article was in type contrasts, the property of the superintendent and the consent histories, the contrast of the contrast of

As before stated, the Golden Butterfly is incorporated in London, and takes its title from the world innoun novel of Walter Beanat of the same name. The line and fortune attendant upon the "Golden Butterfly," as detailed by this fantons writer are proverbial, and it is filting that a mine, known to be so rich school thus be named.

The Golden Butterly will be under the direct management of Major Mo-Laughili, and the other local officer are Stephen P. Moody, superintendent, who is acknowledged to be one of the most expect office in marce in California, has unbounded confidence. Mr. Google for the confidence of the confidence to the confidence of the confidence of the company in II. W. Smithl, and we are pleased to fourn that our young forms and the confidence of the c

The development means much to Oroville and will open up a new era of prosperity in the old ravine, where, in days gone by, there was so much

It emphasizes in a remarkable degree the confidence with which Butte's foremost citizen is held in the financial circles of London. Major McLaughlin's recent successes in mining transactions notably the outcome of the Banner mine at Table Mountain, which, after years of abandonment, has been put on a paying basis extremely satisfactory to the owners and flattering to his judgment and ability as a mining man, together with the very favorable prospects of the Golden Feather river mine, which will be opened this sesson on a more extensive scale than ever before, serves to cause renewed admiration in our people for a man whose ability and enterprise is thus acknowledged and shared in by the leading financiers of the world's great capital.

SPECIAL NOTICES ATELEPHONE COMPANY Which is Not a Decoy a Mora Paper Enterprise to Mislead a Long Suffering Public. The Only Practical System in the

World Which Piners Subscribers in Instantaneous and Direct Communiention with Each Other Automat-

iently. The Multini Aubanistic Telephone Company has been expendited for the purpose of establishing an automatic Telephone Davidson. But those the third New York. The Company struct the Library for the absolute logal and outdoor peritters to now, in the city of New York, the "Stronger Automatic Southern Stronger Stron iew York, the "Stronger Automatic Son A few advantages of the system are: -First-It is strictly Automatic.

energial of surrous Automotic.

Several off completely data away with the "Manual". Setbehhand.
Thini-Connection or communication between sub-arribors to direct and instantaneous.
Fourth-Na central office operation to hear, delay or

embers to these tool becomes and the state of the state o country where it has been in certifine its operation for two prime or inser.

An Exchange has been installed at the efficient of the country, in the Mills Institute (No. 35 Wall etc., 15 Broad etc., 55 Exchange (layer, where it run be been at any time in practical operation.



NIFE ADDITION.

NIFE ADDITION TO EXECUTE THE PROPERTY AND ADDITION TO THE PROPERTY ADDITIONS ADD

and contemplated herein.

For fettings halteration, address.

For fettings halteration, address.

FOR MATERIAL AUTOMATIC TELEPHONIC CO.,

THE MATERIAL AUTOMATIC TELEPHONIC CO.,

A TELEPHONIC EXCELLANGE to the first the contemplate of a subspace system place the contemplate are made between subscribers.

A ATTOMATIC TELEPHONIC EXCELLANGES for a first place contemplate are made by a first-basic discount of the contemplate ar

The markine by a high the powerful it made in all the properties of the properties o

as follow:

Each field, show has peak harbons marked respectively, Patts, Gras, Hardond, Thereuple, When a who-sarther resulties are mainter be proven the lattice for that minuser. The providing of the tatton works. The providing of the tatton works IRS surfaces the band in the Kolston, and print it is differed and lamp-dirac contact with the subtice corresponding to the mainter's levels.

Early while with emperators his convenient, a done, and cannot be a value of mainter in which any other surfaces.

the Board.

Metallic circuits which have been demonstrated to give the best Telephone service will be used with this

Pren the foregoing brief statement of the manner and extent of the recention of the automatic spa-ters. It can be easily seen that until separate ligh-ters, it can be easily seen that until separate light and have the company is caused of the results it at natural see hands have those these exacted for the properly larger accordance.



Al-TOMATIC NOTIFIL BOARD.

On estimates of an attendard between of the second of the s The state of the s ELECTRIC PLANT BURNEDNI

3236 ----The Crocker-Wheeler Company, in Ampers Station, N. J., Lose Factories Old 7 Valued at \$250,000.

The inuserac factories of the Crocker.
Wheeler Electric Company, at Ampere Station,
N. J., were burned yesterday afternoon, involving a loss of more than \$250 cms

The works are situated at Ampere Station, in East Orange, N. J., on the Montriair branch of the Delaware, Luckawanna and Western Railthe Delaware, Larkawanna and Western Rail-road. They were originally built by the Spiral Weld Tube Company, and when that corpora-tion ceared to exist the plant was bought by the Crocker-Wheeler Company. This works ex-tended over an area of seven acres of ground, a large acre of which

readed over an area of seven aerea of general, and a large part of which was covered by the buildings. The me broke out in some unexplained ansate in the elaborate buildings, the works were buildings, the source was in them but the works with the seven and the seven was in them but the water of the seven was in them but the water of the seven which selected from the seven was to be seven the seven which as the seven which as the seven which as the seven was the seven which are the seven was the seven was the seven which are the seven was the seven was the seven was the seven which are the seven was both and the seven was both and was the seven w road, whi ran nearly a quarter of a mile to the heatest alarm box. When the East Orange de-partment arrived the buildings were wrapped in fluxes, and it was evident that nothing could save them. A second alarm was at once sent out, bringing out the entire force of the depart-ment. By heroic work the japanning and cann-ciling building was saved. All clss was de-

ment. In therein work the hymonic and remained of the work of the control of the work of the control of the work of the control of the contro

Dr. Flexver is Formally Installed as Head of

90°. Heavef is formally installed as tend of he New Enterlied Dispersion.

The formal opening of the first electrical clinic in America, "The New York Hetter-Brean-York Control of the America," The New York Hetter-Brean-York Control of the New York Control of the New Yo

Among other cutteriles and irrections. Decrease the paid to the the first of manted Genera the apart to the the first of manted to Genera the apart where exercise their facts is used. In a converge to the paid and the paid to the paid

3238

APRIL 18, 1895 .- EIGHTE

# BIG SUIT OVER THE PHONOGRAPH.

Involves Inventor Edison's Connection with the American Phonograph Company.

-OPPOSED TO HIS CONTROL.

\_\_\_\_ Lawyer Bosto : Objects to the Sale of the Company's Assets to the "Wizard."

HE DEMANDS AN ACCOUNTING

----Lawyer Charles A. Boston, of No. 66 Brend-way, who hold \$2,000 of the capital stock of the defined North American Blackograph Company, of which Thomas A. Edlson was product, has begun a bread cumpating another permitting Re-ceiver John R. Hardin to sell the remaining ac-tive of the corporation to Mc Edlson, who has sets of the corporation to Mc Edlson, who has server soon it, harden to sell the remaining as-sets of the corporation to Mr. Edison, who has offered \$125,000 for the property. Mr. Boston alleges that Mr. Edison is no less a "witzard" of finance than of electricity.

The learning on the position of Receiver Har-

The hearing on the puttlon of Receiver Hardin for periadon to average the offer came up before Chancellon Metalli, in Newark, N. J., Pesterloir, and was adjourned to April 20, in order to give Mr. Edibon exportantly to answer the charges made by Rv. Boston. The Receiver was directed to farnish to any steek-badder or errollion who may make application in writing on or before April 22 answers to questions to bedding on the drains of the constitution. pany, provided they be not prejudicial to the

Interests of life trust.

According to Mr. Boston, Mr. Edison's conmetion with the North American Phonograph.

According to Mr. Deston, Mr. Bolland's con-servines with the North American Homograph of the North American Homograph of Berline in 1904, under contract that all loss director in 1904, under contract that all loss to the property of the company, in the con-pany of the contract that all loss of the con-tract that the contract that all loss of the con-tract that the contract that all loss of the con-tract that the contract that the contract that the contract that the contract that the con-tract th

Art. However, further, therete, that Mr. Billeral before the first product of the control of the

Follows Photograph Works Sittoro for ma-fer a Record that the foregoing facts of-sumed that there were the same that there is should be a full and compar-late there is should be competited to have how he acquired the property and claims party, and that he should be competited to have how he acquired the property and claims bear for 100 Works, or whether, for rooms of the same party of the same party of the company. The flower party has the believes that Mr. Soft-les and a truster of the property for the company. We have the property of the same party of the same party of the salice-of incultarial management of the official the salice-of incultarial management of the official the salice-of incultarial management of the official to

ementative for the an extension of the children control of the child of the children control of the ch

3239

A SIMPLE AND CONVENIENT COPYING PRESS Translated from Le Monde Illustre.
Even people who are strangers to the business occasionally have need to keep an tie copy of a certain letter; but the ordinaling press, with its screw, is an elaborate



3240

NO ELECTRIC CONSOLIDATION.

OLI. 14 146

MIL WESTINGHOUSE SEES NO HEASON FOR FUATTEMPTS AT SOME KIND OF A POOLING

ARRANGEMENT AS TO PATENTS. ARRANGEMENT AS TO PATENTS.

George Westingboss, F., of Pittburg, was at the Wissisor Hosts tyenerday. Mr. Westingbouse has to the Supreme Court to the State that the Line of the Supreme Court to the Line of the Supreme Court to the Line of the Supreme Court and State of the Supreme Court the George Line State of the Supreme Court the George Hosts court of the Supreme Court the George Hosts of the Supreme Court of the Supreme Co

Court. the General Electric scale, sigh, and has West-microbness stock west up proportionately. Since the members are the stock of the effects, and that it was comparable send to effects, and that it was comparable. We will be a comparable of the stock of the stock of the experience of the stock of the proportion for the stock of the out with the stock of the stock with the stock of the stock with the stock of the st

who has been a close student of electric affairs said who has been a close student of electric affairs said cyclerida; "
"Self-with the late of the say, and the sa

iny.

It is rumored that the two companies intend to pool their patents for mutual protection, and in order to avoid expensive litigation. Mr. Westing-house left here for Pittsburg yesterday afternoon.

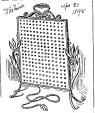
General Electric, on the other hand, was active and closed nearly a point lower, atthough the Street was not informed, nor, indeed, did it suspect until after the close of business that the suspect until after the close of business that the effects to briga about a negotiation between the General Electric and the Westinghouse Manu-facturing Companies for the interchangeable use of patents had been formally discontinued by the directors of the first named. The history of the manner in which the effects referred to have been used to promote speculative operations in the stock of the General Electric Company is told in another column of Time Sux. It is to the credit of the management of the General Electric Company that as soon as it discovered that the existence of a conference committee to negotiate an alliance upon im-practicable lines was being utilized for specupracticable lines was being unusual ser specu-lative purposes, it improved the carilest oppor-tunity to discharge its committee and thus ter-minates movement that had no possible chance of succeeding. Son. 16/17/17/35

3242. Queedolin of Column

OLD CONFEDERATE BILLS UTILIZED BY EDISON

GLO CONTRIBUTE BILLS VILLEAD AT BRIDGE PARKET BY THE PARKE for incondescent lamms. The poper upon which the Confederate notes were engrised was made of the pulp of seatment. This branch of the paper-making industry has since become a dead art. Stagrass paper, when chemically treated by Edi-son, has been found to make the best act of carbon for incambescent lights, and so there is always a demand for the Confederate light.

Tribune how. 3 1895



3245

Edlson and the Katers. From the Philosophica Times.

Berlin he received an invitation of the Warrior in his palace, and of the day a state carriage, corgeous to THE SUN, MONDAY, APRIL 22.

MAGIC LANTERS KINETOSCOPE.

MAGIC LANGING RESERVATION.

District season in the State 1 to the State 1 to the State 2 to the

patent on his apparatus, which thus anables the



from of the electric links of a next of marks

recording to the corresponding to the correspo

3747

UNDERGRUUND EXPLORING. M. Paschal Grousset Defends His Proposals

for Cubtercagen lay singlion. m the European Edition of the Herald.) M. Paschal Grantset, new la hand, continues M. PENNIA PROPERTY OF A BASE CONTROL OF THE PROPERTY OF SUBTRIBUTE OF THE PROPERTY OF THE PROP to that endnest sexual a letter, in which to puts bin the following questions:

1 What is the thickness of the squiferous stratum of the artesian wells of Paris?

2 Du there exist in our soil, below the stepth of 700 meters, other sheets of water which could be utilized?

3. Is there or is there not any trias, or an upper red sandstone series, ander our juracula

upper red assistation action, note? on Proceeds

In there may groun or coan;

In the coan ground or coan;

In the coan ground or coan;

In the coan ground or coan;

In the litting very coan action is the proceeding to the through extent or coan;

out takes of the selection substitute to sain the coan;

out takes of the selection substitute to sain the coan;

out takes of the selection substitute to sain the coan;

of the coan action of the coan;

out takes of the selection of the coan;

out takes of the selection of the coan;

out takes o

MACHINES PROPELLED BY GASOLINE.

MACHINES PROPELLED BY GASOLINE.

IN TELEGRAPH TO THE REMAIN.]

CHICAGO, ILE, NOV. 2, 1835.—Two monocycles, a German machine and a carriage from Springfield, started from the Midway in Jackson Park this morning for a 100 mirror to Wankersan and back, Exo Dawing here offered by Mr. II. II. Kohlsmat for the winner in the test., The start was made at third. observed by Mr. 11. It Keelman for the wine of the Company of the 3248

EXHIBITION OF LIVING MOVING PICTURES,

156 Broadway.

# **BOXING CONTEST BETWEEN** YOUNG GRIFFO and CHARLEY BARNETT.

A Reproduction of the Four-Round Contest (Life Size) held May 4th, before the Eidolograph, on the Madison Square Roof Garden, can be seen at 156 Broadway, every day, at intervals of 15 minutes,

During the Exhibition the Andience will be Comfortably Seated. The objects are shown in a Frame in a similar manner as the ordinary Living Pictures.

This is the first practical exhibition of subjects showing Actual Life Movements on a screen ever made in the world.

### Description of the Bout.

In the first round Barnett led with his left, but Griffo stopped him and countered lightly with his right. They then sparred for an opening. Barnett swung his left, but was neatly stonged and driven to the ropes by a couple of straight punches at close quarters. In the second round, after a few exchanges, Griffo hit Barnett on the neck, and the latter returned the compliment with a body blow. The third round was the liveliest. Both went at it hammer and tongs, and a pretty exhibition of scientific fighting resulted. Griffo had the advantage, apparently, when time was called. The fighters were given two minutes to finish the bout, and in the rapid exchanges that followed Barnett put in two stiff purches on Griffo's stomach, and in return received a hot right swing on the left eye that discolored that optic and caused it to swell. Several clinches occurred during the round, and as soon as the men were separated each time they banged each other severely. No decision was given by the referee—N. Y. World, May 4.

CROCKER-WHEELER ELECTRIC COMPANY,

AND PERSON N. L. THE ANNUAL CONVENTION OF THE NATIONAL FLECTRIC LIGHT ASSOCIATION,

MAY 7th, 1896. DELAWARE, LACKAWANNA AND WESTERN R. R. ONE TREP NEW YORK TO AMPERE AND RETURN. BERLINER PATENT VALID.

THE BELL TELEPHONE COMPANY WINS Tuhul ON APPEALMAY 19 A DECISION BY THE UNITED STATES CIRC

COURT OF APPEALS, WHICH REVERSES JUDGE CARPENTER'S PINDING-IT PRO-LONGS THE TELEPHONE MONOPOLY -THE CASE TO GO TO THE

SUPREME COURT. Boston, May 18.—The United States Circuit Court Boston, May H.—The United Blattes Circuit Court of Appeals teachy handed down as feetings in the Grand Court of the Court

placement, ever an electric list, and the left find a place of the left find of the left o

The consists of the property o

THE GOLDEN MINES. may 16 1895. A Visit to the Banner and Golden Butterfly.

THE RICHEST MINES IN BUTTE. Oroville Mercury. The Former the Model Mine of Callfornia.-Everything Run by Electricity.

Last week, through the courtesy of Colonel Frank McLaughlin, a representative of the Menergy was invited to visit the Banner Quartz mine and the Golden Butterfly, the latter a drift mine just opened, at Morris Ravine on the famous old Hendrick's ground,

The Banner is known to all mining men who know anything about th famous mines of California - It is situs sted about five miles from. Oraville near the south point of Table Mountain, and is approached over a private road, which is well built, well drained, hard and smooth and is in pleasing contrast to the miserable section of county road one necessarily has to take. These private roads have been built at much expense and are as near perfect as any in Northern California, and simply show what can be accomplished in road building where intelligence and honest work is brought into play. The Banner Mine is one of the fam-

ous ones of California. Years ago it was worked by comparatively primative methods and turned out gold in enormous quantities. Then came what has too often befallen rich mines-1000 management, imperfect underground work, caves, heavy losses resulting from slipshed methods, litigation and finally. abundonment. Sometime ugo the property, which now consists of 152,89 acres of patented land, passed into the hands of Colonel Frank McLaughlin, who had faith that it was yet a marvelous mine. It was reopened by modern methods, and, after the expenditure of much time and money, the works being entirey reconstructed and the mine thoroughly developed, it has repaid that faith in a flattering degree and is today the model mine of California, and is the most positive evidence of the good judgment of the one who has resurrected it from a state of ruin and decay.

The miners call the village surrounding the works "The White City," Cer. 3252 tainly it is well named. The buildings, situated on the sloping, tree-covered hillside, are models of neutness and con-

venience. Every one of the structures is snow white, with red trimmings and roofs covered with red fire proof paint. Electric lights swing in the streets, and are found in every room of every house. Not a bit of rubbish, nor scrap of paper litters the grounds and every structure from the general and private offices of the Superintendent is as clean as soap and waterbroom and brush can make it. Every convenience and comfort is accurded the men employed. A large reading room is at the disposal of the miners which they call the "White House" and the largest steeping house is called the "Palace," The dining rooms are large, cool and clean and the food of the best in the market. When all these conveniences and condorts, and above all the cleanliness, was remarked upon, Cal. Mill analdin answered: "It mays me to give the men every comfort and treat them like men, for then when they so to work, either in the mine or mill, they do a man's work. Men appreciate these things and show their appreciation in their work. My experience has always been that it is to an employer's interest to treat them as you would like to be treated yourself." And this idea is carried out in every detail.

The electrical plant at the mill and mine is the most complete and satisfactory in California, and was put in by the General Electric Company. It is perfect in every detail, and the comnany stared no expense to make the power a success. The power is generated two miles from the mine at a point where the Miscene ditch enters the irriextion reservoir in plain view from Oroville. A fall of 130 feet drives three dynamos, generating at the power house about 200 horse power, then the water passes on for irrigation without a particle of loss. This power is conveyed by a system of direct and heavy wires to the motors at the mine, where it runs the mill, concentrating plant and ore crushers and the electrical pumps. At the mine also it runs a large and powerial compressor, this motor being of 75 horse power.

The electrical pumps in the 300 and 500 foot levels are marvels. On landing from the eage at the 300 foot level, we stepped into a station lighted with a series of electric lights, and the bright pumps running without jar or hinderance. This station has the appearance of a well appointed engine room on the surface; and, descending still further into the bowels of the earth, we found a similar station at the 500 foot level. At this point we were taken in hand by Superintendent Rodda and still descended 100 feet to the 600 foot level.

the lowest point in the mine. Here we found the electricity not applied direct, but from its power from the 500 foot level engine, in sinking and pumping by compressed air, supplied by the large generator on the surface. The various levels were lighted up like the streets of a city, and the sturdy miners were at work sinking and drifting with machine drills run by compressed air. And we note that not only is the actual work of sinking and pumping done by electricity, but it is utilized in setting off blasts, thus making it doubly safe for the miners. The vein of precious ore shows up in all the workings, very distinct and separate from its black and slaty walls, and all indications are

towards its permanency. Throughout the mine the air is pure and wholesome, it being ventilated by a counter air shaft in which are arranged escape ladders, so that in case of fire or accident in the main shaft, the miners are absolutely safe.

In ascending we landed on a station 100 feet below the surface. This was constructed to carry the ore direct through a tunnel to the mill and crusher floor. In the mill everything appeared compact, the machinery running smoothly from the electrical power and lighted throughout with incandescent lights. From the "grizzly" or dump at the mouth of the tunnel which tare the shaft at the 100 foot level, as mentioned above, the ore is chuted to the breakers, thence through the self-feeders under the ten stamps, that never cease their roar day or night, and then over rows of glittering plates to the Hendy, Triumph and Johnson concentrators. The process of saving does not even end here, for sluices convey the tailings to settling reservoirs, where all the residue of precious metal is collected for the owners. In the retort, melting and assay office, is another plant, complete in every detail, and before a great while works for the treatment of the sulplurets will be erected.

Materials and supplies are stored in great quantities, and the plant in its entirety is the best that we have ever seen. and competent judges declare that there is none like it in California. Everything denotes success and certainly credit is due the General Manager, Col. Mc-Laughlin and the General Electrical Company for the period success that has crowned their efforts in making this the model mine of the State.

The indications are that the corps of workers at the mine and mill are the best that can be secured. The Superintendent is W. H. Rodda, who has had charge of numerous large mines in the United States and in Central America, He is a thorough miner and has the entire confidence of his employers. He received us with true mining bospitality, extended every courtesy and made every endeavor to make the visit a pleasant and profitable one.

THE GOLDEN BUTTERFLY. From the Banner to the Golden Butterlly is a distance of about two miles, and over most of the distance a fine private road has been built. After dinner at the Banner, we were driven over this

road, over historic mining ground, to where was once one of the largest hy-Iraulic mines-the Hendricks, A description of this property and the plan of re-opening it by the drift process by Col. McLaughtin was published at ength in the Mencuay some time ago. Work in pursuance of these plans, under the able Superintendent, S. P. Moody, has already reached a point where the greatness of the operations

may be apprehended. As at the Banner, the first work was to provide shops, boarding houses and lodging houses, blacksmith shops and other necessary buildings. These have now been completed, and the same air of red and white paint, cleanliness and perfect orber and system pervades everything, louses have been rebuilt and new ones ected, and the scene of rain that incressed the visitor a few months ago, is ow changed to one of prosperity and dvancement.

The tunnel is already under way is billide beneath the enormous slide that once rained all. It is by far the best piece of work of the kind we have wer seen. Its whole 80 feet is timbered in the most substantial form, and looks as if it would endure for ages. Three shifts of men drive it forward day and night, and most satisfactory progress is eing made.

That the channel and gold is there must be doubted, and the systematic samer in which the work is progressing leaves no doubt but that the Golden Butterfly will soon pass the chrysalis stage and develop into another big ine for Butte county.

In conclusion we may say, that, from brief visit to two of the mines man- 3255 aged by Col, McLaughlin, the people o Oroville have slight conception of the enormous amount of work that he has secomplished, and the great good that has resulted therefrom. These mines are permanent and enduring, and in this article, necessarily brief, we have not detailed half that is to be seen, or intimated a hundreth part of the credit that is due to the active promoter of it

TO TRAVEL BY ELECTRICIT

New York and Northern Bailroad Will Use It as a Motor Power from Harlem

At a a Motor Yower from Harlom

Acy 25 1935

Patrons of the Now York and Northern
Balmod, plying betteen 150th street and
Yonkers, may, soon saboy riding to and from
their beatness by the jad of electricity. Experiments with a new motor system, which
periments with a new motor system, which
are being quietly made at You Courthant
are being quietly made at You Courthant Park.
The New York Central and Hudson River

The New York Contrains all Hospitals for Series quietly made at Yan Courthagh Contrains and Hospitals for Series (1997). The New York Contrains all Hospitals for Series (1997), which is the property of the Series (1997) and the Series (1997)

3257 NORTH SEA CANAL MEDALS. A medal commemorating the completion of the North Sea Canal, which was opened but month with impeding ceremonies, insulers issued by a Berlin firm. It is made of silver and is about one and one-third inches in liameter. The obverse side, as the



shows, bears a likeness of the German Emperor in naval uniform, surrounded by the inscription "Withlieft III. Deutscher Kalser." On the reverse side is a map of the cenal teritory, will route aboveling the naving distinct, in the control of the c are stamped in the outer rim. Only about 5,500 of these media will be collect, and this comparatively small supply will very likely zoon be snapped up by patriotic Germans. Hesides this media the anne firm has also coined a large number of others, with inscriptions in nies different languages, which



105

3256

SEASON COMPLIMENTARY.

40 MINING CAMP. COTTAGE GROVE AVE.

/ r. Chas. Batchelor, New York.

# BICYCLE THAT FOLDS UP

3258

Captain Gerard, of the French Army, Invents a Machine That Has Been Used to Advantage.

One of the great leconvenience of the otherwise show of the providence of the otherwise show of the

From Articles, who should almost help of the property of the first property of the property of

As invention of this kind interests exclusive the country the higher floors of houses, where there is at present no convenience for storing away bicycles. To go up to the fifth thoor carrying up thirteen kilos on the back is nothing. To carry up an ordinary bicycle is nothing. To carry up an ordinary theyeld a force in apprachicable und always trouble-

3261

### An Old One.

The tricycle here shown was made just 30 years ago, in Cincinnati, by Monsieur Pinqueley, a dancing-master. It weighted



160 pounds and could be driven at the rate of six miles an hour. It is still in fairly-good condition and is owned by H. C. G. Ellard, of Canon City, Col.

### A NEW CHAINLESS BICYCLE, its Inventor Has a Dovice for Constructing the

Frame of Bosslow.

An investion if this city, who has reveally perfected a device for meeting personnel and even for meeting personnel and even for meeting personnel and even for the second personnel person Frame of Ramboo.



A NEW BICYCLE THAT DISPENSES WITH THE CHAIN.

two inches. The driving levers being nearly double the length of tho present pedal cranks now used on the challa bleych, it is claimed an increase of sower is obtained—lenee an The investor will construct the frame of his challalest bleych of bankino, as he has receively discovered a process has been a great drawback in the use of the material for bleyche frames.



3263

# TO SUCCEED THE TANDEM.

New! Investigation by Which Two Cyclinic Section May Bills Abreant, S. / Section May Bills Abreant, S. / Billyte handland field seem schelmed to historic cheen some over of a morbine that will toke the place of the landene witerd now in new. Then british appear to favor a wheel on which two Ferreira the seed to pick. See the place of the land to pick. The place of the land to pick the place of the land to pick the place of the land to the place of the land to the place of the place



ORIGINAL MOTOR ON THIS BICYCLE. New Machine Which, It Is Asserted, Will Reduce Exertion and Accelerate Speed.

A new bleyele, with an original motor, sped up the hill at Riverside Drive and Ninetysecond street yesterday afternoon. The in-

3260

NAS OURSTORS AND ASSISTED.

From Your Service of from the remains of the local service of the

3265 BICYCLING MADE EASY.

JACO SUPCILING MADE EASY.

One Investor Provides as Excitic Maler and Assister a Davice for Measuring. Assister as Davice for Measuring and Assister and Measuring man, neared on a horse-close of containing min man, neared on a horse-close of containing min man, and the result of the containing the containing the result of the containing t



3266

LATEST MANNER OF BICYCLE.

ventor asserts that the wheel will save its rider a was amount of exertion and give him rider a vist amount of exertion and give him a high rate of speed.

The most noticeable point about the work

The meet noticeasise point about the working qualities of the machine was that while the control of the machine was that while the control of the control of



TRAIN RACING RECORDS. 1575 auct 5 AMERICAN RAILWAY HEN ON THE PRICES OF ENGLISH PLYERS.

The Empire State Express Said to Have Made 100 and 102 Miles on Hour on Several Decadons and to have Covered the Distance Between Syracuse and Haffalo at the Rate of 67.05 Miles an Hour, or Three Miles on Hour More Than the Northwestern's Resnet Bifferences In Conditions in England and America. If rolling a seed continues to increase at the If railroad speec communications to another steam present rate, the two nailes in a mbude steam oncline may be here as quickly as the mile in two mlawic trotting horse. The recent great runs on the Noethers tern and Great Northern

runs on the Northers term and Great Northern roads from London to Abstructs have retirated the attention of raile and men here, and it is not smither that searching with to done sout to bring the speed record both to America. The American artifaced most loads not adult that the record lies ever left nece. All they will obthic it but for all our flow in Buffels term has made a faster run than any American train served life for the same declares, and our trains every life for the same declares, and our trains no American train has ever done it, they say, is no American train has even hore in easy freely of that throughous nod happen to be any stretch of track 5 in mice; bong, except on the lank whore read. The officials of that read do not believe in extraordisarily fast time, and will not permit in extraordisarity fast time, and will not permit trains on their rand to make record time. The fastest train they ever run was the Chleaca flyer, during the World's Fair. That train make the run from New York to Chauga in twenty hears. A reporter for Thic Sev talked with General Neurrietendant Van Etten of the New York Control Builtond vesterder about

New York Central Badfrond yeakerday about the possibility of fact raunding.

"The New York "entral," said Mr. Van Etten, "runs the fastest regular train in the world, and it is going to confine to do see. I'm not talking about exhibition runs noor; I'm not latking about exhibition runs noor; I'm

sensitive term that the order. The recent manufacture of the control of the contr cular train in the world. The recent remark le runs in Product are exhibition runs al

between Strauses and Hutfale, and reversely represent the second strains and the second strains are not represented by the second strains and the second strains are returned to the second strains and the corresponding data remain reason and the corresponding data remains the second strains and the corresponding data remains the second strains and the corresponding data remains an extended the second strains are required to the secon

"I show a body theorems bears doubt that our removes no winter. Their employer may be a superior of the control of the control

mer. Her. ANY other, with relevant per newer and the second of the secon ters inflates. We have done it is twenty-three with arrange in s."

The original 1855 have a record for a single mile at the rate of 100 miles as hom. Another on 1869, 180, made a mile the other day in 137 sec-

FAST TRAINS IN ENGLAND.

THE BAILBOAD BACING BETWEEN LONDON AND ABERDEEN.

Details or the Contest dust Ended-510 Miles in 512 Minutes-Long Distances Tencerard at 67 and 64 Miles an Hour-The Empter State Express Still the Pasts rat Regular Train in the World - The American Record Only Bruten Once, The great race from London to Aberdeen be-

The treat rate from boulou to Aberdeen, between the each and west roat lines one over, both lines have returned to fixed time the loss, both lines have returned to fixed time inches, and though the west cost lines both line record, which is a westless record less long distance, which is a westless round less long distance, and have the way of time and cost which in the way of the way of the property of the prop

The compaction between the top there have defined assumed to the attention of the detailed and in resident the there are defined as the control of the contr The competition between the two lines is one

On July 1 of this year the fastest trate form On July 1 of this year the fastest train from London to Abechen, 2023 miles by the astern route, left London at a in the exenting, arriving at Aberhera at 1355. By across between Lewen at Aberhera at 1355. By across Lewen London and Northwestern and the Carlot, like London and Northwestern and London miles, of the London and Northwestern and London directs to the binary and a half. Public started in direct and the binary and the

3271 BEAT ALL RECORDS. New York Central Train in a Run to Buffalo Makes More Than

Sixty-Four Miles an Hour. . ENGLISH LAURELS CAPTURED

Faster by More Than a Mile an Hour Than England's Speediest Train.

OUR CARS TWICE AS HEAVY, ----

As the Engine Drew Into Buffalo at the End of the Wonderful Trip a Great Crowd Cheered.

INT PERSONAPH TO THE HUBARD.] [hr felegraph to the hybrids, Spirits and New York Central train, which left New York chis morning, dashed into the East Noric city this morning, dashed into the East Biffale atation, having accomplished the trip at the greatest spred for a continuous four-ney of any train over any road in the world.

The distance from the Grand Central Sta-

The distance from the Grand Central Station, New York city, to the East Indialo station—25% miles—was covered in 47 minutes, 7 at hours and forty-server minutes. This is, at the rate of \$4.31 miles an hour. The highly level, which was covered in the morial was the factors in the world, was 600 miles in the mortal was 600 miles. in 51 minutes, or at the rate of 63.212 miles

It Eclipsed the English Record in

our. In other words, the American magnet the English record by more magnetical the English record by more at mile an hour.

A HEAVY TRAIN.

Yew York Central train comprised four cars—one combination smoking and be, car, weight St. 79 pounds; one car, pounds; one car, St. 700 pounds, and car Marquits. seefght 19,000 pounds. weight of four cars, 33,310 pounds. weight of four cars, 33,310 pounds, practically the same as the regular practically the Empire State express, exhat in regular service the latter train throwing room car instead of a private thought the same weight.

The trils heated by equates No. 30, this framew World's, (but) however, but were the control of the control of

The state of the s

in pilles (1987), and consider a From Datastin and the Constitution of the Constitutio

SOME PAST HUNS ON HALLROADS IN THIS COUNTRY AND IN ENGLAND.

One of the first tests of extraordinary spens e long distance on a railroad was the run

of the finished express on the London and North Western Indiancy, of Ingined. In Article William (1998), and the Control of the diseases between London Control of the diseases between London Control of the State o

BEAT THE ENGLISH RECORD , Run from New York to East

Rus from New York to East

| Buffalo. | Solution |
| B feat which the efficient of the New York Central road undertook and accomplished on Wednesday hast by sending a train from the Grand Central Station, this city, to East Buffalo, a distance of 420½ miles, in 497 min-utes.

These are the figures given by General

Three are the figures given by General Passenger Agent George II. Dankles in a semi-official report made yesterday. At that trate the average speed per hour was 64.30 milets, as against 62.32 milets, as against 62.32 milets needed by the English rading train between Aberdeen and London. There was some innocuracy in the figures sent from ilutials on Wednesday, giving the time of arrival at 12th. 51m. 57s. which was the time at Willlams street, whereas the time at East Buf-

Websterdam, arthur the flow of arrival will have stored, whereas the time at East Battlems stored, whereas the time at East Battlems stored, whereas the time at East Battlems are also as the stored of the stored

Central trains, published in this meraling's edition of your patter.

New York Contral relative New Yorks to Exest Inference York Contral relative New York Construction of Adoption to Design New York Construction of New York Construction of

By computing you will perceive that the lightest grant part of the perceive the per

The arrange made that the New Contention of the American Contention of the Contention of the American Contention of the American Contention of the American Contention of the New York (American Con

The space of the s

# OUR TRAINS THE FASTER.

NEW YORK CENTRAL STILL HOLDS THE REST THREE PECONDS parison of the Official Times of the

Fast English Runs with the Run to Ruc falo-The Central Nearly Half a Mile on Hour Ahead in Speed, and That with m Train More Than Three Times Heavier. It was to be expected that the great record made by the New York Central on Sept. 11 would not be accepted with good humor by the English railroads, still puffed up by what they accomplished in the "race to the north." From the other side of the water come assertions that

the other side of the water come assertions that, the West Central teme was superior to that of the New York Central because it was inclusive of stora, that the merit of the performance was jarenter because the Displicit gradients were steeper, and because the distance was longer. The only conclusive answer to such states must make the publication of the official means much to the publication of the official ments must be the publication of the official times, which every one can read for himself, and frem which he can draw his own conclusions. The time for the New York Central train is given by Mr. Leonard, secretary of H. Walter Web, Taril Vice-Priction of the road, a the official timesterger on the run to Dandau the official timesterger on the run to Dandau the official timesterger on the run to Dandau timesterger on the run timesterger on timesterger on the run timesterger on timesterger on timesterger on timesterger on timesterger on timesterger

THE HITTER STITUTE BOYNES.

The weights of the trains are from the against a first train and from the Against a first trains, and from the Against a first trains, and from the Against a first trains and from the Ag

Miles.	Flatfor :	Time
	London, King's Cross Depart,	
100,16	GranthamArrive,	
	Grantham	0:15
158.20	York Arrive,	1102
	YeekDepart, 1	1:05
253.20	New coatle	2:23
	Newcastle	
502.61	EdinburghArrive.	
	Edinburgh Depart,	
43150	Dundes Arrive.	3:21
	Dunder Depart.	F:23
113	AberdeenArrive.	4:40
	Cress to Averdeen, 573 miles, in 565 mil	

WEST COAST BECOME

Thursday, Aug. 22. Load, three bogie cars, weigh-

cluding stops; average, 03.28 miles per hear. Enstein to Aberdeen, 540 miles, in 2074 minutes, exchelling stops; average, 63.84 telles per house. Two stops, 434 minutes.

NEW YORK CENTRAL RECORD, Wednesday, Sept. 11. Load, four cars (three sleep ers, one private), weighing 1925; tons.

New York to East Buffale, 4334 miles per New York to East Buffale, 4334 miles, in 407.32 minutes, excluding stope; average, 52.70. Two stop, 4 minutes.

The New York Central train therefore heat

The New York Control train therefore best arms of the Control train the Section 1 and the Control train the Section 1 and the Section 1 an

467, munica, institued above. 2. The inter-sequence of the institued above. The inter-sequence is a single state of the institued above. The institued above. The institued above. The instituted above. The institute above. The

## 32 74 RAILWAY RECORDS FOR FAST TIME

Heraid - 1870 - 5-61-23 Statistics Prepared by T. N. Ely Showing What Trains Have Done Here and Abroad. 

LONG DISTANCES AND SPEED.

Claims in Behalf of the Pennsylvania Company Made by the Chief of Motive Power,

WHEN IT HAS BEATEN OTHERS.

(OT TELEGRAPH TO THE HERALD.) CAPE MAY, N. J., Sept. Z., 1956.—Theodore N. Ely, chief of motive power of the Penn-sylvania Haliroad system, was asked to-day what the facts are in the controversy day what the facts are in the controversy between American and British rullways over speed records. Mr. Ely had come to Cape May for an ocean bath. He has just completed a careful examination of the most recent official records and summarized them

or me, "First of all, the world's record for a long

for me, and the matter record for the last admission train, and let fig. "The me fail and the fig." The me fail and the fig. "The me fail and the fig. and the fail and the fa

The catter and the state of the catter and the catt

3275

## NEW RECORD MADE IN RAILROADING.

New York Central Train Carrying Heralds Makes a Phenomenal Run to Syracuse.

BEAT 68 MILES AN HOUR.

The London and North Western Road Must Take Another Try to Reach Heralds AT BREAKFAST.

The special train on the New York Central

The special radius on the New York Central Radius of Arrive the Hanasate from this Gilly to Spracuse has been all previous for the State of the State of the State of the Hanasate of Hi miles a knowly train, based with narroyate, made an average speed of 4.7 miles and the representation of the Hanasate of Hi miles are speed of 1.8 miles of the Hanasate overall time some than the experiments overall time that the recent made by the English radius of the State of Hanasate of Hanasate overall time that the recent which made that recent, the train was more than the state of the state of the Hanasate of t

The train left the Grand Central Station at 1 when the train left the Grand Central Station at 2 with train left the Grand Central Station at 3 with the required reduced the train about. There was no attempt to get off a precisitly early relation, as since of the entire the contrast of the central cen

anecdotes of Colisons Tillians his 3 1895 MR. EDISON'S ABSENT-MINDEDNESS.

NO ENOWING WHAT WOULD HAPPEN IF HIS WIPE DID NOT TAKE CARE OF HIM. Many famous men have seen noted for their ab-sence of mind. Of the well-known men of the day, none hos a more world-wide reputation than Thomas A. Edison, the great inventor, and probably

The continue of the continue o

# NOT OVERHEAD.

SIGNIO - 1890 Lenox Avenue's New Trolley Begins Work with Every Promise of Success.

OPEN TO PUBLIC TRAFFIC.

Carries Passengers at Short Intervals Buril Midnight Without Wishan.

CAPABLE OF HIGH SPEED.

The feasibility of the underground troiler for New York has been practically estab-

A car on the Lenox avenue line drawn by the new motor passed down the avenue yea-terday, turned into 116th street and conpleted the connection with the Columbus avenue cable line at 169th street by way of

avenue cable line at tour savenue.

Cars have been running on Lenox avenue.

For averal weeks, but their work has been
moutly experimental. The electricians of
the General Electric Company, which is
building the system for the Metropolitan
Traction Company, have been busy perfect-

ing the system.

Cars have been running from the northern sinus of the roud at 16th street and



Jennes avonue in 12th street and Elighth avo-nue. From here her ord rans west to Man-hattan avenue, where it terms south so-hattan avenue, where it terms south so-tantial terms are also as the south of the Columbian avenue, where it entences with Turnista, we assume it rans one block to Columbian avenue, where it entences with the columbian avenue of the columbian avenue of the voterial morrista. At all of clock the first property morrista. The set of the columbian property of the columbian avenue of the columbian avenue of the columbian avenue of the columbian residents who were up at that early house Lenox avenue to 116th street and Eighth ave-

were aware of the important character of the MPG protection of the important character of the MPG protection of the important character of the important character of the services, not even as much as a Lab minister of the services, not even as much as a Lab married also about a decent passenger. On reaching columbus arrange inc. The order then returned, after a five minute wait, to the norther terminal, after a five minute wait, to the norther terminal, after any were run out under five minute head way until midnight, when all but one of them were turned.

into the statum. From mirrially swill be really and the real property of the real property of

3280 A CHANGE OF MOTIVE POWER

THE METROPOLITAN TRACTION COMPANY MAY EXTEND THE UNDERGROUND ELECTRIC SYSTEM.

ALL WILL DEPEND ON THE BEHAVIOR OF THE LENOX-AVE EQUIPMENT IN WINTER WEATHER, BUT THE COMPANYS OF

FICERS LOOK FOR GOOD RESULTS. The Lenox-ave, underground electric system of the Metropolitan Traction Company has proved to be so successful during the short time it has to be an authorising during the anoral time it has been operated that the company has decided that if the coming winter weather does not interfere with the operation of the Lenox-ave, system the other railway lines of the company shall be uittmately equipped with the same appliances and sperated with the same motive power as the

Lenovave, line. The Lenox-ave, road, equipped with the under-ground electric system, was opened on July 9. It begins at the Columbus-ave, cable road, and begins at the Columbus-ave, cable road, and running through One-hundred-and-Manhattan-ave. One-hundred-and-sixteenthest, Manhattan-ave. One-hundred-and-sixteenthest, and Lenox ave., ends neal the power house and the Harlem River. During heavy rain-storms there have been in hitches or breaks, and it is operated so smoothly. safely and cheaply that the company has concluded that the underground electric system shall be used in the operation of its other lines as soon as they can be economically equipped-always provided that the snow, slush and cold of winter do not show that the system is defective.

WINTER WEATHER NOT LIKELY TO INTER-

It is not thought that snow, thaws and freezing weather will be obstacles in the way of satisfactory operation of the Lenox-ave. line, but as the system has not been tested under the severe conditions of winter, the results produced during the approaching winter months may have much the approaching winter months may have much to do with the company's final determination in the matter. It was said by officers of the combined of the combine

It costs about twice as much to construct and reminister as a substitute of the cost of th

por time expenses.

THE TWENTY-THIRD-ST. LINE NEXT. The Twenty-third-st, cross-town car line is that which the company expects to equip next with the underground electric system. The large power-house now being completed in East Twenty-fifthest, will have a splendid new plant Twenty-dithet, will have a splendl new plant for the production of cable power, and it is likely to be used until it needs extensive regular or re-placting. So the beautoness, we had the con-placting the production of the con-cept of the control of the con-cept of the control of the con-trol of the con-place of the con-trol of the con-trol of the c

there is not a herecar on any of the compon's of Course, and that shepends largely on the wary of Course, and that shepends largely on the wary of Course, and that she was the same, almah and freeding awaiter, and the works as the course of the course of

EQUIPMENT OF THE UNDERGROUND SYS-

Any one who has ridden on the Lenox-ave. the most have noticed the smoothness will which the cars are run there and the absence of wires suspended overhead as in trolley lines The equipment has the appearance of the cable road, of which it is the continuation. Labl become the value appears the exterior of the mental value of the continuation of the mental value of the continuation of the continuation of a cert, such as used on the relative care, there is a read of the relative care is a read of the relative care in the relative of the planch. These channel from other shades of the planch of the relative care is a read of the relative care in the relative care is a read of the relative care in the relative care in the relative care is a read of the relative of the relative care in the relative care is a read of the relative care in the relative care ino read of which it is the continuation. Laid be-

### 3281

PRECIOUS POSTAGE STAN-Hearly Leaf 1996 (From the European Edition of the Herald.) Whatever may be going on in other spheres of investment, that occupied by arbitror of Investment, that accupied to prevent stages officient appears to be more record to the prevent stage of the prevent stage o 1272

THE DISCOVERY OF ARGON. San 1892 Che Che 21 DETAILS OF THE PINDING OF THE AIR'S NEW ELEMENT. 1905

Work of Lord Hayleigh and Prof. Hamesy Which Resulted in Separating Argon-Facts that Have Been Settled &been the New Gas-An American Chemist Who Came Near Discovering Hellum.

LORDON, April 10.—There is no abatement in England in the interest excited by the simul-taneous discovery in the laboratories of Lord-Rayleigh and Prof. Rausay of the new gas, arron, the third constituent element of the at-mosphere. When Lord Rayleigh lectured on the subject at the Royal Institution in Albemarie arrest last Friday, the all too small theatre made Listeric by its associations with Paraday made listerie by its associations with Paraday and Tyndail was overcowded ione before the appointed hour, not only by scientific but largely by social London as well, and those who were unable to obtain cards of admission re-gretted their absence. Noris the reason for this popular interest far

to seek. Argon is a popular gas. The scientific ignorance who could not distinguish between a chieride and an oxide, and would hardly know a chioride and an oxide, and would hardly know a spectrescope from a sittincrope, has, at all events, imblied somewhere and somehow atood to be a mechanical mixture in un-sual proportions of oxygen and nitrogen all his life without knowing it will sur-prise him as muchas M. Jourdals was auton-prise him as muchas M. Jourdals was autonprise bim as much as M. Journisis was aston-ished when be iserted that he and been speaking prose all his life without knowing it. The very school boy wants to learn what arpon is and how it is found. If interest had flagged, the linely discovery by Prof. Hanney of helium—a sub-stance hitherto imagined to be purely selec-ations with argon in the rare Newverien mineral clevelies would have given a new spur to public claretic would have given a new sport to public attention. Moreover, the position and personal charm of Lord Rayleigh added to the cleak of the control of the control of the control of members of the aristocracy given over to pleasures not always of an easiling Kind, Lord Rayleigh, with his patents of mobility and his modest formum, has lived a life of text-ning, has chosen to patent labor often relu-tation of the control of the control of the laboration of the control of the control patent and the control of the control of the laboration of the control of the control of the laboration of the control of the control of the laboration of the control of the control of the laboration of the control of the control of the laboration of the control of the control of the laboration of the control of the control of the laboration of the control of the control of the laboration of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the laboration of the control of the control of the control of the control of the laboration of the control of the control of the control of the control of the laboration of the control of less, and his evenings to contemplations, some-times unrewarded. I think nearly everybody umes unrewarded. I think nearly everybody who understands the matter is sensething more than gratified that such a man should become one of the immedia of estence and the rectifiest of the Faraday medial—a gold one—bree [Linnauder of the Faraday medial—a gold one—bree [Linnauder of the Section of the sect acknowledgment of his own achievements. Lord Rayleigh, too, has great personal charm. He is the most modest of men, and seems to have no thought but the pursuit of truth. Ask any of the professors—some of them grampy essengs, as the world knows—what kind of creation Lord that proteoner—most of both grindly designed, provided in a flower of the provided in a flower of the time of the provided in a flower of the time of the provided in a flower of the provided in the provided in the state of the provided in the state of the provided in the state of the provided in the p

daring specuation on a nazipi stream selectific magination. Its production is not the consequence of a sures which intend cut true. Lord impleigh from a numberly specificar, which had hardleigh from a numberly specificar, which had the days when Cavendhid discovered hitrogen, and he and down to salve it said severe the strength of the service of the problem, but it is not to select the said the said to the strength of the selection of the problem of the problem of the selection daring speculation of a nightly strung scientifi loigh and Mr. Rammay have outered, but he other work to do than that to which the per and professor have successfully set their hands It is to Lord Rayleigh's infinite credit that have ing leisure and knowledge enough, he devoted them to a task from which others have turned

them to a task from which others have turned.
With the problem everybedy by this time is telerably familiar. The sitregen obtained teleminally, for instance, from ammonia, is found to be appreciably takout one-one-hundredth in rough figures! lighter than the aftergen obtained from the sitr. "Why this theorem?" as tained from the air. "Why this thusnes?" as Artemus Ward used to ask. Is it because the nitrogen of the air is an allotropic form of the nitrogen from ammonda? Are they, that is to say, the same thing, only different? Or is three another gas? And if there he another gas, where another gas? And if there he another gas, where it's 1, is in the chemical nitrogen, we'll it in the light 1, is in the chemical nitrogen, we'll it in Hariston the light 1, is another than the Hariston the light, assailly, perfectionity, use disappointment, make up his mind to answer it disappointment, make up his mind to answer it makes the light 1, is and the light 1, is an experience of the

semestimas about him is werth setting down. In Cardina, and tracking it students to the time dark Landson, and tracking the students to the time dark Landson, and tracking the students to the landson of the students of the enthulanam of a college class. His cavers it as seri of procession of successes, and they have somewed that in more exertimes, and they have somewed that it is not exertified to seeman blass. He follows ofcoring research to closely as he studies Dogithi investigation, and his suddests was post to be a forward of the property of the suspect has been as the sum of the property of the hard to be a forward of the property of the sum of the second at the first place. He is as loudd in appoint on a box is learned, and Leed Insylving could not have supply to second the with a more

Secret rates as a selegate secretaria was an automatical and a specific parties for the fall feet of the specific for the specific feet of the specific surveys in its sector feet of the specific fee helpful and loyal confrère. Amon which of the partners east argue to the previous first previous the previous and the previous first the previous farmer and the previous first first previous first first previous

or commence of the same of the

choice, one would be more locitified to believe that intergen obtained from visible substances contained what ir may unselemintually term insuranties than that those impurities should be in the air. The fact that the word "impurities" runs quickly off the cod of the pas in such a connecties shown how more inhoustin saturally run. Hu 'Prof. Rammay's predisposition—spain, "vil but satural"—was all in Arev of the purity. of chemical nitrogen. He did not have much

or enemiest introgen. He am not have much faith in the air. But hat as it may, Lord Hayleigh spent his energies for naught in endeavering to isolate the lighter gas, the existence of which he suspected in chemical nitrogen. He falled, as Prof. Stamas) had expected and almost predicted that he would fall. Chembel nitrocen is the troe nitro-gen—the real one, the absolute obtained. Argon is atmospheric. When he heard of Lord Hay-leight's disappointment, Prof. Ramsey niked penniseion to pursue the investigation aboug the lines he had hisself originally suggested. There was no hesitation in soccording assent. Both was no hesitation in according assent. Both chemists then pursued their independent ways, neither knowing what the other was doing. Each hat some hold upon the trath almost as once. Neither now claims to have antisipated the other. They took different methods. Lord Rayleigh separated his nitrogen by the oxygen method associated with the name of Prof. Vernon method associated with the name of Prof. vertice Harcourt of Oxford; it is a correct but some-what tedlous process. Prof. Ramsay, by as pretty a machine as he has in his college labora-tory, forced bubbles of what may still be called atmospheric nitrogen into bubbles by mercur; through a tube containing heated magnesium; more rapid method, but possibly requiring more expert skill. Whichever method was tried however, the result was the same. After all the nitrogen-pure nitrogen, what has hitherto beer nitrogen-pure nitrogen, what has hitherto ber known as chemical nitrogen-had been at sorbed, there was still left a residual gas, an un mistakable substance which, tried by the spec-There have been critics who do not believe in it. Prof. Dewar of the Royal institution, the successor of Farailay, and a very able expositor of

In Paul Down of the Borth Institution, the design of the Borth Institution, the design and the Borth Institution of the B mand, nor of them habe-related enterties stone of the control of t

SECTION OF FOUNDATION AND UNDERGROUND CONDUTT

An availa in seeds for tending, some extensions of the control of

time. The second account of the control of the cont

size an account and the hypercentiles attained and account and all the proof of the discussion. The size of the si

the processor described with a first point to the beautiful process of the control of the contro

ORIGIS OF THE AURORA BOREALIS. Sea 1675 CAN 2.1 Prof. Berthetot Talks of His Experiments with Argon in Paris.

ORDITAL OF PRICA SIGNAL AND ADDRESSALS.

PARTS AND ADDRESSALS AND ADDRESSALS.

PARTS AND ADDRESSALS AND ADDRESS

3283

3284

THE AIR'S NEW ELEMENT.

Sur Safe 1995.

POINT AROUT AROUT AND HEL

LIUM NOT YET MADE CLEAR.

Results of the Latest Experiments with the New Element - Both Exhibit Contra-dictions-The Latest News About Them. The present state of knowledge with recurd the room and belign its summed on its a bina-

distinsa-The Latest News About Tires,
and the same of the control of the control

been proved for helium. What erblence exists is derived from the properties of argum. It is known from countless examples among the compounds of carbon and hydrogen that is retast in molecular weight is accompanied by a rise in the boiling point, and it is a proved fact. rise in the foiling point, and it has proved fact that a complex molecule has a higher boiling point than the simpler molecule from which is is formed. Thus a proof that the nodecule of ornine is complex is supplied by the fact that it bolls at a higher temperature than expen. The belling point of arron is 187 degrees, between belling point of argon is 187 degrees, between nitrogen and oxygen; if argon consisted of more than one atom its belling would be above and not below exygen. This is no proof, of course, but it strengthens the conclusion that argon is monatomic; if that canclusion is correct it ap-

monntomic; if that conclusion is correct it ap-plies also to helium, and it follows that the atomic weight of helium is 4.20.
An asswer to the question, liou is it that ar-gon occurs in the alt and helium only in miner-als; why is not helium present in the ale? given by 1br, Johnstone Stoney seems satisfactory. Bu by Inchalastons Stoney seems onlifectory. However, the regress that it Deprogen were present in all-present the all-propens were present in all-present the present the presen

over timesphere soul for the prevence of the line meeting of the line of the l

of 40. The periodic theory admits of no excep-tions: in fact, one of the reasons for bolleving in argon was that it did fill a gap in the table, as

When he has soon the necessary to exclude a few prices of the control of the cont

3286

A New Pitters for Goggers Recognitive to the Control Recognitive to the Con

3284

The Kennelly Therapeutic Sinusoidal. Machine.



Price, Complete, Spicioni,

Edison Manufacturing Co.,

of 19 treet. Hew York Otto

FOR SALE BY

antons were operated continuously from dark until 10:30 o'clock acplit during the fifteen years the plant has been in operation. The plant was installed in the early part of 1830, and on the 2d of May in that year the dynames were first started.

In the light of present practices and beliefs it seems impossible that the wiring of this pioneer equipment should have been in use for fifteen years on shipheard exposed to dampuess and other possibilities of injury



RELIES OF THE FIRST MARINE INCANDISCENT INSTALLATION.

without having cursed serious trouble, but despite this the No. 11 cotton-covered paraffined wire, which was used for the mains, and the No. 32 cotton-covered paraffined magnet wires used for the branches, all being stapled to the wood work and painted over, remained in supper to the west work and painted over, remained in serviceable condition to the last. It is stated, however, that originally the plant was installed without fusible cutouts, and that the necessity for cutting off the current by some means upon the occurrence of any abnor-mal condition in the circuit such as would be occasioned by short circuit, leakage, etc., was impressed by earlier xperiences with this plant, and that before leaving for her trip around Cape Horn, the Columbia's lighting plant was provided with safety fuses in the mains near the dynames and in each lamp seeket or at each lamp. All mains and lamp circuits were bunched together, and the main bus wires from the dynamos to the switchboard, or more properly speaking, to the fuseboard, were of bare copper wire stranded and inclosed in a soft rubof bare copper were stranded and melosed in a soft rub-ber tabing, each has having a strand for each circuit controlled from the faseboard. The dynamos were driven from a countershaft driven in turn by a pair of high-pressure vertical engines. The countershaft, which was directly over the dynamos, was run along the aftward wall of the main engine room, and the arrangement of belting between the engines and the dynamos through the countershaft was at a very high angle, in order to economize freight space. A further peculiarity ested in the fact that the armature of the exciter was riven at half the speed of the armature of the lighti-

The difficulties attending the first installation of incon-The difficulties attending the first installation of mean-descent lighting could be made very clear by an ox-amination of the Columbia's plant. The first lot of lamps installed were of the paper carbon variety, which were so delicate that it was soon found that the jar of the ship's engines broke the filaments at an alarming rate, to overcome which, the lamps were fitted into small turned wood bases and suspended by strips of felt ribbon. Later wood receptacles were used that were placed flat against the surfaces of the ceilings but seperated therefrom by light thick felting to minimize the jar. The sockets wherever used were of complicated type mounted entirely in wood, but the staterooms were lighted by means of lamps mounted on receptacles or the small wood bases described and completely enclosed in ground glass globes so as to be beyond the reach of passengers. These lights could be controlled only by a wooden switch located outside of the stateroom and furned on and off by a key in the hands of the steward. It was necessary, therefore, to ring a call bell and await the response of a steward before the lamp could be lighted or extinguished. and often then it would be necessary to resort to the use and often then it would be necessary to resort to the use of the oil lump, because of the fact that the regulation of dynamoss was such that they could not control the poten-tial under material changes in load. Parts of the light-ing apparatus here described are shown in the accompanying illustration.

The foundational destrict lighting plant on the Columbia proved a source of wanderment, not only not be Pacific Coast, but at every pert at which the vessel stopped on her coyage around the Horn. Through Mr. Villard's association with Mr. Edison's and the O. R. & Villard's association with Mr. Edison's and the O. R. & Stop at every perhapit pot and give exhibitions of the apparatus. The engineers of the Columbia who have been with the vessel from the time it was built, state that the lange of the paper carbon variety did not outside the control of the paper carbon variety did not outside the paper of the paper carbon variety did not outside the paper of the paper carbon variety did not outside the paper of the paper carbon variety did not outside the paper of the paper carbon variety did not outside the paper of the paper of

In addition to the incandescent plant, the Columbia was provided with a 2000 c. p. power search light operated by a small Siemen's vertical type dynamo with von Hefner Alteneck drum armature. The vessel, when refitted, will be provided with a 400-light Siemens'-Halske generator, direct connected to a triple expansion marine type Union Iron Works engine.

3290

Needless for make in the second of the record introduction of and copen extention, produced by recorder motion copens with a chemical production of the control of the and is subside for its all control of the control and is subside for its all control of the control and its subside for its all control of the control and its subside for its all control of the control and its subside for its all control of the control of the



DESCRIPTION.

This little alternator (shown in cut on top of table on right) is intended for the production of sinusoidal alternating currents in electro-therapentic treatment. It is driven by a small motor running on the Edison direct 130 volt current (shown on left.) The field frame is of laminated iron supported by castings, and has twelve poles. On each pole is a spead with two windings of wire. The inner, has eight layers of fine wire, and the outer, two layers

All the fine-wire windings are connected in one :eries, which constitutes the secondary or delivery coil. All the coarse wire windings are connected in another series, forming the primary or field winding of the machine. By this arrangement it is only necessary to drive the armature, which is a combination of laminated iron disks, to transform the continuous primary extrent into alternating current waves in the secondary circuit, and by duly proportioning the grooves and projections on the armature surfare, these waves are made sinusoidal.

Twenty-four alternations or twelve complete periods are generated for every revolution of the armature, and since a speed of 4,800 revolutions per minute can be attained, the frequency can be carried to 1920 alternations per second or over 115000 alternations per minute. For steady training a more moderate speed and frequency will usually be desirable.

The primary winding of the alternator is excited by the 120 volt direct current, which is controlled by a lamp rheostat, the switchboard operating same being shown in the rout of cut on the right and the lamps being placed under the table. In this way the strength of the secondary currents can be controlled independently of the frequency

The speed of the motor, and consequently the - umber of alternations of the secondary currents can be varied by the lamp rheostat shown in the front of cut on the left, is this rheostat is included in the motor circuit.

The Bailey Rheostat shown in the centre of the table is conneeted in shunt with the secondary circuit, and is used to vary the strength of the current applied to the patient.

# TO PUT THE OUTFIT IN OPERATION.

Screw the attachment plug, at one end of the connecting cord,

into the keyed socket at the back of the table underneath the top, and the attachment plug, at the other end of the cord, into any stationary socket connecting with the electric light mains. Turn the key in the socket that the attachment plug is serewed into, so as to bring the current into the instruments.

### TO START THE MOTOR.

Throw on one or more of the switches on the switchboard in front of the motor. This will start the motor and the speed is increased by throwing on the remaining switches.

### TO CONNECT THE BAILEY RHEOSTAT.

Fill the glass receptacle to within one inch from the top with water, and attach the two pin connections on the green cords (coming through the table) to the two binding posts at the rear ends of the horizontal rods carrying the earbon leaves, and the rheostat is now properly connected.

### TO EXCITE THE ALTERNATOR.

Throw on one of the switches on the switchboard in front of the alternator. If more intensity of current is required, throw on the remaining switches, one at a time.

### TO USE THE SECONDARY CURRENT.

Connect the sponge electrodes to the two hinding posts in front of the table, and start the motor and alternator. Bring the leaves of the Bailey Rheostat close together, before applying the sponges to the patient. Then gradually turn the milled head screw, so as to separate the carbon leaves, until the requisite amount of current is attained.

When the carbon leaves are both close together, almost the entire current passes through them, and consequently the current passing through the patient is very small.

As the leaves are gradually separated, by throwing the milled head screw on the rheostat, the proportion of current through the rheostat is diminished, and correspondingly the proportion of current through the patient is increased and so on.

The sensations that are produced by the application of this instrument, differ radically from those which result from the employment of an ordinary faradic coil. They are much softer, more agreeable, equally developed at either pole, and generally exhibit the characteristic sensations attributed to sinusoidal

were operated continuously from dark until 10:30 o'clark each night during the fifteen years the plant has been a operation. The plant was installed in the early part of 1880, and on the 2d of May in that year the dyuno- were first started.

In the light of present practices and beliefs it seems impossible that the wiring of this pioneer equipment should have been in use for fifteen years on shipboard exposed to dampness and other possibilities of injury



TLED.

h the v

Iways felt

ty's steam.

w on the

neiseo la

etric light-

placed on

plant in-

the hands

al Edison of will be

ry of this

its practi-

of incan-

to to Mr.

N. Co. and

in the lot-

nd of Mr.

a was he

equipped f Mr. Edi-

eer of the

ngineerin

placed in his work

peaks th

the plant

a quarter

hines, it is

can be us.

o, and the ofand re-

nd proper

dison lon

known as

these maof them utilized as

output of ed for 115

r. Pa., and

RELICS OF THE FIRST MARINE INCANDISCENT INSTALLATION.

without having caused serious trouble, but despite this the No. 11 cotton-covered paraffined wire, which was used for the mains, and the No. 32 cotton-covered paraffined magnet wires used for the branches, all being stapled to the wood work and painted over, remained in surples to the stated, however, that originally the plant was installed without fusible rations, and that the necessity for cutting off the cur-rent by some means upon the occurrence of any abnor-mal condition in the circuit such as would be occasioned by short circuit, leakage, etc., was impressed by carlier experiences with this plant, and that before leaving for er trip around Cape Hora, the Columbia's lighting dant was provided with safety fuses in the mains near the dynamos and in each lamp socket or at each lamp. All mains and lamp circuits were bunched together, and the main bus wires from the dynamos to the switchboard, or more properly speaking, to the fuseboard, were of bare copper wire stranded and inclosed in a soft rubber tubing, each bus having a strand for each circuit controlled from the fuseboard. The dynamos were driven from a countershaft driven in turn by a pair of high-pressure vertical engines. The countershaft, which was directly over the dynamos, was run along the aftward wall of the main engine room, and the arrangement of belting between the engines and the dynamos through the countershaft was at a very high angle, in order to economize freight space. A further peculiarity rested in the fact that the armature of the exciter was riven at half the speed of the armature of the lightin-

The difficulties attending the first in descent lighting could be made very amination of the Columbia's plant. lamps installed were of the paper earl were so delicate that it was soon found ship's engines broke the filaments at a overcome which, the lamps were fitter wood bases and suspended by strip Later wood receptacles were used that against the surfaces of the ceilings bu from by light thick felting to minin sockets wherever used were of complie entirely in wood, but the stateroom means of lamps mounted on recepts wood bases described and completely of glass globes so as to be beyond the re-These lights could be controlled only by located outside of the stateroom and fu a key in the hands of the steward therefore, to ring a call bell and await therefore, to ring a call bell and swait steward before the lamp could be lighte and often then it would be necessary to of the oil lamp, because of the fact tha dynamos was such that they could not tial under material changes in load. ing apparatus here described are show panying illustration.

The incandescent electric lighting pla bin proved a source of wonderment, Pacific Coast, but at every port at stopped on her voyage around the Hor Villard's association with Mr. Edison's N. Co.'s interests, it was arranged that stop at every principal port and give e apparatus. The engineers of the Col-been with the vessel from the time that the lamps of the paper carbon var last much of the trip to the Pacific Co replacing of burned out lamps becau frequent. Upon arriving on the Coast lot of lamps was received from the East boo filaments were used; these gave i faction and many of them, it is stated. 5000 hours, while some have burned 90 very few lamps that were seldom ected on the circuits when the

montled In addition to the incandescent plan was provided with a 2000 c. p. power s ated by a small Siemens' vertical type d Hefner Alteneck drum armature. T. refitted, will be provided with a 400 Halske generator, direct connected to a marine type Union Iron Works engine.

3290

ess of this fact when the vessel was at sea the four dyit regard-\* Electrical Engineer (N. Y.), Vol. XV, No. 252, March 1, 1894

The electromotive force attainable in the secondary coils amounts to fifty volts, but on closing the secondary circuit under the conditions of ordinary application, the voltage at secondary terminals usually fails to less than twenty volts, depending upon the amount of external resistance.

The alternator and motor are finished in nickel and are provided with self-oiling learning. The lamps belonging to the rheostat are all placed undermeath the table so as to avoid any inconvenience to the operator arising from the brilliancy of the lights.

The apparatus is mounted on a pelished quantized out valide handsome design, and the workmanship on the outle outfit have sudding to be desired. If the outfit is required for use in a city where only the alternating current motor in place of the direction where the contradiction of the direction of the contradiction of the contradiction of the direction of t



PRICE, \$35.00.

3288

PARTON RECORD OF PATTYPE.

PARTON RECORD OF PATTYPE.

PA

Jacy 1895.
THE COLUMBIAS PLANT DISMANTLED.

Exercised formal, confinements which he exist the provider mount the interest which he exist in the tree provider mount the interest which the exist in the treepen Rainbayand Navigation Company's eterniship Columbia, will fade, for that vessel is now on the dy-dock at the 'tunion from Works's San Francisco, being entirely reconstructed and its concrable electric light construction of the stable for commercial purposes and placed in the hands any vessel in the world, but was such the first plant of this most being the construction of the stable for commercial purposes and placed in the hands of untiled parties for operation by the original Edison Electric light Company, has been term out and will be Electric light Company, has been term out and will be free the light Company has been to moving of this most interesting instabliation has here to describe of the first force; but now that the equipment has creased its practical narializes it is invest that the event should be re-

The credit for conceiving the installation of incandescent lamps on shipboard appears to be due to Mr. Henry Villard, then President of the O. R. & N. Co. and the Northern Pacific Railway Co., a Director in the Edison Electric Light Co. and an intimate friend of Mr. Edison. This was in 1879, when the Columbia was being built at the Cramps' Shipyard, in Chester, Pa., and orders were given that the vessel should be equipped with incandescent lights. At the suggestion of Mr. Edison Mr. J. C. Henderson, then advising engineer of the O. R. & N. Co. and now prominent on the engineering staff of the General Electric Company, was placed in charge of the installation, and that he did his work well, even though in a manner that now bespeaks the erudity of the state of the art of incandescent installation at that time, is evinced in the fact that the plant has a record of service for a period of nearly a quarter of a million hours with no repairs to the machines, it is said, except the rewinding of one field coil, and a few minor repairs to the bearings, etc. So far as can be ascertained the Columbia never lost an armature, and the commutators have received only such attention and renewals as has been necessary from normal and proper

The Columbia plant consisted of four Klison long field cree dynams of the original type now known as the "Z" pattern. The expectly plant of the original state of the chiese was 60 left, p. hauge, but as only three of these chieses was 60 left plant plant grant plant plant grant plant grant plant grant gra

salans, were operated continuously from dark until 19:30 o'clock each night during the fifteen years the plant has seen in operation. The plant was installed in the early part of 1880, and on the 2d of May in that year the dynamos were first started.

In the light of present practices and beliefs it seems impossible that the wiring of this ploneer equipment should have been in use for lifteen years on shipboard exposed to dampness and other possibilities of injury



Relies of the Fibst Marine Incardiscent Installation,

rithout having caused serious trouble, but despite this the No. 11 cotton-covered paraffined wire, which was ed magnet wires used for the branches, all being tapled to the wood work and painted over, remained in erviceable condition to the last. It is stated, however, that originally the plant was installed without fusible rent by some means upon the occurrence of any abnormal condition in the circuit such as would be occasioned by short circuit, leakage, etc., was impressed by earlier xperiences with this plant, and that before leaving for bor trin around Cape Horn, the Columbia's lighting plant was provided with safety fuses in the mains near the dynamos and in each lamp socket or at each lamp. All mains and lamp circuits were bunched together, and the main bus wires from the dynamos to the switchboard, or more properly speaking, to the fuseboard, were of bare copper wire stranded and inclosed in a soft rubber tabing, each bus having a strand for each circuit controlled from the fuseboard. The dynamos were driven from a countershaft driven in turn by a pair of high-pressure vertical engines. The countershaft, which was directly over the dynamos, was run along the aftward wall of the main engine room, and the arrangement of belting between the engines and the dynamos through the countershaft was at a very high angle, in order to economize freight space. A further peculiarity rested in the fact that the armature of the exciter was driven at half the speed of the armature of the lightime.

The difficulties attending the first installation of incanscent lighting could be made very clear by an examination of the Columbia's plant. The first lot of lamps installed were of the paper carbon variety, which were so delicate that it was soon found that the lar of the ship's engines broke the filaments at an alarming rate, to overcome which, the lamps were fitted into small turned wood bases and suspended by strips of felt ribbon, Later wood receptacles were used that were placed flat against the surfaces of the ceilings but seperated therefrom by light thick felting to minimize the iar. The sockets wherever used were of complicated type mounted entirely in wood, but the staterooms were lighted by means of lamps mounted on receptacles or the small wood bases described and completely enclosed in ground class globes so as to be beyond the reach of passengers. These lights could be controlled only by a wooden switch located outside of the statersom and furned on and off by a key in the hands of the steward. It was necessary, therefore, to ring a call bell and await the response of a steward before the lamp could be lighted or extinguished, and often then it would be necessary to resort to the use of the oil lamp, because of the fact that the regulation of dynamos was such that they could not control the notenial under material changes in load. Parts of the lighting apparatus here described are shown in the acpanying illustration

The incandescent electric lighting plant on the Columbia proved a source of wonderment, not only on the Pacific Coast, but at every port at which the vessel stopped on her voyage around the Horn. Through Mr. Villard's association with Mr. Edison's and the O. R. & N. Co.'s interests, it was arranged that the vessel should stop at every principal port and give exhibitions of the apparatus. The engineers of the Columbia who have been with the vessel from the time it was built, state that the lamps of the paper carbon variety did not outlast much of the trip to the Pacific Coast, and that the replacing of burned out lamps became monotinously requent. Upon arriving on the Coast, however, a new ot of lamps was received from the East, in which bamboo filaments were used; these gave much better satisfaction and many of them, it is stated, have a record of 5000 hours, while some bave burned 9000 hours, and a very few lamps that were seldom used were still connected on the circuits when the plant was dismantled

In addition to the incandescent plant, the Columbia was provided with a 2000 c. p. power search light operated by a small Siemens' vertical type dynamo with von Hefner Alteneck drum armature. The vessel, when refitted, will be provided with a 400-light Siemens'-Halske generator, direct connected to a triple expansion marine type Union From Works engine.

3290

Mention to make in the parent of the recent translation of an interest of the recent translation of the control of the control of translation. The translation of which are not included, but the substance is not an above, and the control of the co

<sup>\*</sup> Electrical Engineer (N. Y.), Vol. XV, No. 252, March 1, 1894



A COUNTY OF THE PARTY OF THE PA

WIL CAWTROENE UNBIN, ENGLAND. COLEMAN SELLERS, UNITED STATES SIR WILLIAM THOMPSON, SCOTLAND. THEODORE TURRETTINI, SWITZERLAND. THE INTERNATIONAL NIAGARA COMMISSION,

Mr. Romaine Callender will give a demonstration of his new Automatic Telephone Exchange System in the Decker Building, Union Square, for a period of thirty days, commencing June 21st, 1895.

Mr. C Batchelor is invited to be present wa-

at either of the hours, II A.M. or 4 P.M.

Oer 1895

ACRD BY ROPE THANSMISSIC

3294

# HIGH SPEED WITH ELECTRIC MOTORS

Trains on the Nantasket Beach Railroad Made Eighty Miles Herald an Hour June 23 EXPERIMENT IS A SUCCESS New Haven and Hartford Company

May Make Extensive Changes in Traction.

WILL IT SUPPLANT STEAM?

INT TELEGRAPH TO THE HERALD. I BOSTON, Mass., June 22, 1955.—The test of the electric motor last night on the Nan-tasket branch of the New York, New Haven and the control of th

3296

### TWO ELECTRIC ROADS TO WASHINGTON. New York Parties Will Furnish Capital for One of Them.

Baldwin-Westinghouse Combination Will Have One Ready in Three Weeks.

One Ready in Tures Weeks.

IF YIMMORATIO TO THE INEAL.).
PHILL-GENERAL AUGUST, \$1,953.—At the Baldwin Locomotive Works to-day draughtsmen were busy working upon plans for the
trucks to be placed upon the new type of electricks to be placed upon the new type of seletricks to be placed upon the new type of seletricks to be placed upon the new type of seletricks to be placed upon the reconstitution.
The new completed local three weeks. Two
forms are the made-one, for light work and reprocess will be made-one, for light work and

### BALTIMORE'S BIG ELECTRIC MOTOR. Satisfactory Test of Hauling Trains Through the Belt Line Tunnel.

the Bell Line Tunnel.

[INY TELEGRAPH TO THE HEALD.]

BALTIMORE, Md., June St. 1886.—The big electric topomotive which will haul trains of the Baltimore and Ohlo Railread through the Belt Line Tunnel was given a thorough test Belt Line Tunnel was given a liferough test to-day. There was not the slightest friction, and the great machine, upon which the builders have spent a year, proved a complete success. Two trips through the tunned were made. All, that remains to complete the great enterprise is the introduction of permanent electric connections, when the work will be ready for regular use.

At present the commettees, are only tem-

perior A. Alb willivest cuttered the manning that the said is a second of the said that the said is a second of the said that th porary. As the current entered the machin-SECOND ELECTRIC ROAD IN CHICAGO.

A few weeks ago we published arous in-formation about the such section in England per the such section in England per Vannow. We have made for the England per cent of the Section of the Section of Auto-ceans with the Section of the Section of the Section of the Section Computer with the State-computer of the Section Section of the Section of the

3298

A Junca nelestit, M. Rogument, has got discovered how to make a final great ward of the control groun delitik. Nor, as every dose bester productions that is an extension and productions tested, and exacts all the high properties of ferrale with with the limit of the control of the

### 3300

Lat A Nam Plantein Can Hanter 1996



/ NEW YORK HERALD, SUNDAY, JULY 7, 1895.

# BALTIMORE'S LELECTRICAL GIANT.

Draw Passengers and Freight Through the Tunnel.

Up and Down the Track at Will.



Best precented dense materials of the ma

# BY TROLLEY 60 MILES AN HOUR

The Ninety-Ton Locomotive Ready to Railroad Equipment Will Be Revolutionized if These Experiments Succeed.

LIGHTNING VERSUS STEAM. THE ELECTRIC LOCOMOTIVE

An Engine Which Pulled a Steam Iron Horse A Trial on Nantasket Beach Which Was a Surprise to the Railroad . World.

ITS DIMENSIONS AND POWER. HOW THE WIRE IS PLACED.



HILLE the United States has been almost retiremed during the state of the state of treating roads to sumply the state of t



ELECTRIC LOCOMOTIVE, NANTASKET BEACH.

not be consider operation until the second season are the second season across the first of the first completed trans.

The test of the first completed trans, translated across and capacity the representation sensols of the bosonic translate translated translated

Secretary began of the General Mental Secretary Secretar

when a grain in was down the many the street of the street



98-TON ELECTRIC LOCOMOTIVE, THE LARGEST IN THE WORLD.

GERMINATING POWER OF SEEDS
Sun 1995 Oct / Vitalian Experiments with Steed Kept for Seventeen Years in Chemicals and Alcohol.

A secondary with head fact the contract of the

# WORLD'S RECORD AGAIN BROKEN.

Trip from Chicago to New York in Seventeen Hours and a Half.

### LAKE SHORE'S FAST TRAIN.

and Methods Resident Lathe, which set set all the second s

Five Hundred and Ten Miles at a Speed of 64.98 Miles at a speed of 64.

OFFICIAL THE OF THE FAST RUN.

HOLL STATE TO THE FAST RUN.

HOLL STATE TO THE THE STATE RUN.

HOLL STATE STATE RUN.

H

Pattern S. 1992.

Prince of the control of the cont

HNAPP AND HIS BARREL BOAT.

Principle a Practical One.

F. A. Enapp, the inventor of the Knapp roller A Principles of Nazardinal Onco.

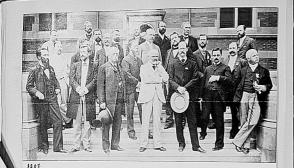
A Principles of Nazardinal Onco.

A Principle of Nazardina Onco.

A Principle of Nazardi

THE TELEGRAPH IN CENTRAL ASIA.

The Construction of the Construction of Agrana Bells of Viller Construction Agrana Charles Fartestian Construction of the Cons



THE RESERVE OF THE PARTY OF THE

Standard High Duty Electric Elevate

THE OFFICIAL DELEGATES

3304 COLLECTORS AND DEALERS INVEST DOLLARS FOR PRIZED SPECIMENS.

Division of the control of the contr

33 03 Her 1875 STANDARD HIGH TWO MARGERING ELEVATOR

3304 PHILIPPA LEBON, born May 29, 1768, French

"There's Wise Employment of the 18 years and 18 years and

wares, senture of water, intercept marker than a griddstore, will make our impression upon a diamond. We often hear it subi that a number of differ-We often hear it said that a number of differ-ent stones will cut glass. The treath is, that only the natural edges of allowed crystal will cut glass, while many steers, such as the sop-phies, ruby, quartz, and even common paster, will scratch it.

will senatch it.
Some distracted exhibits an abnormal degree of, lardwast, expecially some very bountful black onces from pattern which cannot be greated up pattern by anything but their own its tool distracted buts, frequently, and with the control of the pattern of special expectations.

that as notice upon them at all. One of three teams and the subject of specific specificacy by likelying at Park. In lettal of the Front Accession of the Section of the Se

and of an option of even and consolidate parts of the control of t

when the control of t

of the court of th

## . 33/1

Jart think of an egy morth over \$1,000, in a large gloss eras at the Academy of in a large gloss eras at the Academy of in a large gloss eras at the Academy of the Academy

3312 . K HERALD, TUESDAY. . .

# JAY GOULD'S

He Left Personal Property Worth \$80,000,000, According to the Official Appraisor.

### REAL ESTATE OF \$2,000,000.

The Report Awards \$6,000,000 to George Gould for Twelve Years' Services.

FIELD ESTATE LITIGATION.

Claims Which, if Upheld, Will Leave Nothing of a Once Ener-

mous Fortune.

Lawrer David McClure, who in March, 1883. was appointed by the Surrogate appealeer to fix the value of the estate of the late Jay Gould at the tipe of lits douth, in December, 1802, with a view is determining the amount of tax that a view to determining the amount of tax that should be imposed upon the personal property, has made his report, by which he finds the value of the personal estate of the late millionnaire to be upward of 1800-000. Under the flaws of 1802-"An act in relation to

Library line Laws of 1802—"An act in relation to Javable transfers of properly—"one per cent of all the personality in access of \$50,000 gies to the Stite, bear like Comprehensive for collec-tion, which is five per cent on the first \$50,000 and one per cent on the remainder. At the time the will and coulded of Mr. day Goodel were filed be will and coulded of Mr. day Goodel were filed to the control of the control of the control of the the control of the control of the control of the control of the the will not coulded to Mr. day Goodel were filed to the control of the control of the control of the control of the the control of the control of the control of the control of the the control of the control of the control of the the control of the control of the control of the the control of the the control of the control of the the the will and codied of Mr. Jay Gould were filed for probate, shortly after his death, it was stated that his real estate amounted to about \$2,000,000, and the value of his personal prop-erty was estimated at about \$70,000,00. Mr. McClure, in his report to the Court, . Mr. McCulro, in so far as there were sub-parted to me reports of public sules at the facek Erchange, lossed my appraisal attetly upon spel safes, and in other cases have reached the values reported by me upon the best in-formation I could obtain. The condition of this formation I could obtain. The condition of this color, as to the ownership of targe blocks of Souds of different classes, of shullar like of certainty and the color of the co

Section of the different public and the differ

S.T.C., St. Levil, from Montain & Senthern By Co. con. mort.

210. Senthern By Co. con. mort.

211. Texas & Pacific By. Co. first 7,ENLESS 21,725 1,322 Setter second mark. 500, The Waltan R. R. Co. second 

| April 1997 | April 299 | Apr

Contents
Paritie Mail Steamship
Contents
Interactional and Great
Northern Hallway Com-45,720 00 

The state of the s

See the second property of the control of the second property of the

910,260 1,912,500 1121,000 230,000 10.012 50 335,000 90 642,184 30 lo,000 on No value No value No value

## STABILIMENTO STEFANO JOHNSON CONTARIONE DI MEDAGLIE

LABORATORIO ARTISTICO INCISIONE DI CONI MILANO.

TRANSLATION.

MILANO, March, 1897

RESPUCTIVE SIR!

The year (892 marks an historical epoch in the History of the New World, -- being the fourth Centennial of the Discovery of America - recalling the glory of the great

### Christopher Columbus.

In recognition of this event, this commemorative Medal has been struck; on the right side (or (font) of the Medal is the head of Columbus, taken from documents lately found. At the left side in Indian princess extends her hand and grasps that of Europa at the right. The princess tramples a serpent near an idol, while the emblems of literature and art are at Europa's feet. Directly above the joining hands is the Western Hemisphere, showing the course taken by Columbus on his first voyage. Below the head of Columbus is an Eagle-ready to fly-a symbol of American progress. Close inspection will reveal a marvelous amount of artistic detail.

On the reverse side of the Medal the results or fruits of Columbus' discoveries are portrayed. In the centre is the figure of "Civilization" surrounded by Genii. Below, is seen an Indian warrior. bewildered at the development and prosperity of America. To the left is shown a coast line view of your great country, with the Capitol at Washington in the far distance. In a circle, enclosing all, are the Coats of Arms of all the States. For over one year this great work received my undivided attention. The most painstaking care has been devoted to it, without any regard to expense. The design and modelling is the work of Prof. Pagliaghi. The engraving was done by Mr. Capuccio, director of the Laboratory of Engraving. As a work of art the Medal speaks for itself; it has received encomiums beyond expectation, being pronounced by the artistic world "of marvelous art, rare artistic work and perfect in execution,"

To the greatest Republic in the History of the World, to its People, to its Institutions, to the Land of Liberty and Progress, this work is respectfully dedicated by

STEFANO JOHNSON.





Medaglia coniata pel IV Centenario

# CRISTOFORO COLOMBO

These Medals were struck in the Laboratory of STEFANO JOHNSON, Milano, in commemoration of the 400th Armiversary of the Discovery of America.

### CAUTION.

Unscrupulous parties have made attempts to reproduce these medals, by a cheap process of casting. The imitations are easily distinguished, being extremely crude and

The public is notified that all original Medals are enclosed in boxes, with the r "STEFANO JOHNSON" stamped on bottom.

c. F. WIGAND.

Sole Agent, 13-15-- 17th St. New YORK

Orbertha Dresident

# ELECTRICITY KILLS AN ELECTRICIAN.

Franklin Leonard Pope Shocked to Death While Examining the Plant in His Home. \_\_\_\_

CURRENT OF 3.000 VOLTS.

Was One of the First Electrical Engineers in This Country, an Inventor and an Author,

SERVICES IN DRAFT BIOTS.

Inv. very market on THE HERALD, Inv remainsel for the microby, Inv. remains and many Rammourtov, Manor, Oct. 1, 1965.

Pranklin Leonard Pope, an electrician whose skill has non-him prominence, and who has coccupied several important positions as an electrical engineer, was instantly killed at his home in this town by an electric shock When an attempt was made to term on the electricity to light his house this evening. Mr. Pope discovered that remething was wrong with the wires, and that the lights would not burn properly. He went to the cellar to make an examination of the convester with a view to remaining the defecactor, with a tree to remeasure the force; in the wiring. Not long after he had de-scended the stairs, members of the family in the upper part of the house beard the round of a full in the cellar, and the explosions of

Unon investigation Mr. Peoc was found lifeless, his holy lying beside the converte.
You physicians were immediately sum-moned, but their efforts to resuscitate him were of no avail. The exact measur in which the farality

occurred his not been acceptained, but it is known that 1200 roles of contricity pursued through the body.

Mr. Pope was one of the most prominent. of this community. He was been in the house in which he was killed,

PHINKAIN LOXARD FORE HAIR A EMPTL CARLES FRANKLIN LOVARD POPE WAS A Well known electrician, and for twenty-five years a real-drait of Hitzbieth, N. J. He has lived in destriction, and for twenty-the years, a realcontrolled and the state of the stat 3315

# HOW WAS MR. POPE KILLED See Ope 1895 THEORY OF HIS RESTREEN RALPH W. POPE. 26

strické or 11.5 millette 11.5

count neuroren. These generates save a re-port to preparation, which will seem be pul-lished. shed. Mr. Pope's steey of the occurrence shows that

his seather was apparently the victim of an achis scaler was apparently the whelim of an ac-cilent, soldy due to the fact that in order to test the lines and observe the working of the plant he had permitted the placing in ais celler of a concerter, which are resisted the booling in of the primary wires of the system, earrying a and the adjust values of the system, correcting a summer than the state of the stat normal voltage of 2,100. These wires were

3816 MECHANICAL,

Mr. Porbes on Electrical Engineers, Mr., Forbes on Electrical Engineers.
Tornin Entrino or This Riog. Seri: Mr. Goorge
Forbes, a commonplace British electrician wha
comerged from observity sereral prara ago when
several Anglomaniaes secured for him an appolament as consulting electrical sunfiner
for the convention which built the electrical
power works at Ninzers Palish has published an
article in Illustraceol's Magnetine for September,
and mallical to very mergrania bit, Illustraceo
min mallical to very mergrania bit, Illustraceo
min mallical to very mergrania bit. in which he exposes his calcileances, Faccanaco, and mailes in every practages he fine situation, and mailes in every practages. The exposure of the situation of the exposure of the exposure

price in localization in a manufacturer of our constraints and appears in insurance of the second of

ransmitting essectricity, shu these American plans were adopted.

G. Willfram Prance, Engineer, New York, Oct. 3, 1895.

3318

### Edison Is Out. iov 6 Finally Dropped from the Pay Roll of the Cectivity tl. E. Company //85

About two weeks ago Mr. Edison was notified by Mr. C. A. Coffin, president of the General Electric Company, that his retainer fee of \$100 a week would be discontinued at once, but that if he (Edison) was in need of money, the same sum would be advanced to him every week and charged to his account.

Mr. Edison did not accept the situation electrolly, but at once called on J. P. Morgan & Co. and expresed himself with some emphasis. It was finally decided, we believe, to place him upon the pay roll of the Edison Illuminating Company of New York for an equivalent amount, for services rendered in years part.

3320

### The Slavianoff Electric Metal Casting System.

The electric acting process derived by Nicolai Slavi-ority of the process of the process of the process of the schedule length by A. Lebmann in the distraction of both schedule length by A. Lebmann in the distraction of both schedule. The method embodies the principles of both infusion of weak method in the process of the principles of both surface of a method in the process of the principle and a surface of a method explosively the puricipant parts surface of a method of the principle of the principal principles of which is the method to be east, while the other may be of which is the method to be east, while the other may be of

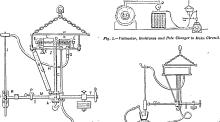




Fig. 1.—Automatic Regulating Device.

Fig. 3.—Casting Small Articles.

THE SLAVIANOFF ELECTRIC METAL CASTING PROCESS.

3319 A LEWIS AND CLARK MEDAL FOUND. A LEWIS AND CHARK MEDAL POUND.

From The Portland Oregonial, who has I is attendance at the Spokanie fruit fair, been with him an interesting rolle of the Lewis and Consequently was need overland by Persident Jahren Consequently was need overland by Persident Jahren Consequently was need overland by Persident Jahren of Triently Persident Medical Persident Jahren of Triently Persident Jahren of Triently Persident Jahren of Triently Persident Medical Persident Jahren of Triently Persident Jah

a varied nature. The electrode serving as the carding material nates the form of a but, and is of the same negative within it in principal to the form of a but, and is of the same negative within it is produced in the arrange of the interest in the carding most constituting the other pion, and will be a subject to the carding most discovered by the carding most discovered by the carding most discovered by the cardinal transit of the cardinal transit in temperature of the cardinal transit in temperature of the cardinal transit in temperature of the cardinal transit in the card

Accidental Discovery of a Wonderful Illuminant in the Gas from Acetylene.

OF GREAT PRACTICAL VALUE Heraid how 10 1193 Its Manufacture Possible Wherever Coal and Lime, Its Constituents, Abound.

GAS COMPANIES ARE IN CONTROL.

Rights Promptly Secured When the Possibilities of the Chemical Compound Became Known

NUMBER of the the most wonderful filu-minant yet invented has come from the ac-chiental discovery of a

Similar of reliable in the formers, extert that we will be the service of the ser

Nature had been once more at work in her

naphtha, for example, from the petroleum

Interior personnel lies incite about newlyteens and the reason with gas even with the add of the new acceptance or the consumer. As a consumer the companion of the consumer, the companion is think, at most less cout than the companion of the consumer, the companion of the companion of

Dath the effectiveness with a first melegrate because it is a superior of the first method of the control of th

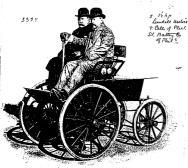
minute by the lowest properties of the propertie

oratory for the benefit of man. Chemical

- Basicalator, for the Switzell of man. Christician should be a second of the format of the second of the format of the second of the format of the second o

Bee of Pennyivania, terrestrigi, have 'a nine days wonder in the Cunker the New York company the directors (Charles P. Dietrick, who is associated many gas companies; Daron E. J. annowaki, pred Prod, feercatry and surer of several Western gas corpora-director of several Western gas corpora-director of several was a company owns from the Company owns the Company of the Company owns pipes for the United States and South

RUBBER TRADE BOOM. | From The Pittsburg Dispatch. One of the most interesting of current event from the viewpoint of the electrician, is the new



Scientification MORRIS ATD SALOM'S ELECTROBAT MIN 16 1893



All the light through the end of the buth. 3322

### 3324

THE PHONOGRAPH TOLD THE THOUSE. IN NEW-TORK IT EXPLAINED JUST WHA

ATLED A BIG PUMP IN CALIFORNIA. To those recole who look upon the obsequently a a scientific toy this story will be of interest, and it will be none the leas so to those who know of the practical purposes to which this remarkable in practical jurposes to which this remarkable in-strument can be just. It appears that the Knowless Pump Works put up one of their large pumps for the Richis Water Company at the Bilk River pump-ing station in Culifornia. The pump was in con-stant use for some years and the makers heard no complaint until a few needes ago, when they re-ceived a newl communication from II. I. Bicket, the manager of the pumping station.

There was no doubt in the minds of those at the

stat'on who were best acquainted with the mechan-ism that something was wrong with the pump. but they were unable to fix on the defect, and an the disinemberment of the pump would involve much loss of time, and as a visit by an expert from the Bast would mean a considerable expense, the phonograph was resorted to. The manager spoke into the receiver, describing the symptoms of the alling pump, and further to indicate the case, he placed the receiver so that the pulsations of

patent the renouve so that the market the case, because the renouve so that the section of the parameter of the renouve so that the renouve so tha

b experiment proved absolutely successful, and came of the roll the discuse was disproved. The ir remedy was suggested, and the pump is ing once more "good as new."

WALTER TOWNS

VERY NEAR THE DIAMODY. In this hashes, for the hacket they see in gridals are the property of the property of

Shanna Faine. Out: 10c-10c during the property of a set \$\text{Maxima Faine.}\$ Out: 10c-10c during the property of the \$\text{Maxima Faine.}\$ Out: 10c-10c during the property of the \$\text{Maxima Faine.}\$ Out: 10c-10c during the property of the \$\text{Maxima Faine.}\$ Out: 10c-10c during the property of \$\text{Maxima Faine.}\$ Out: 10c-10c during the \$\



CARBORUNDUM FURNACE.

cost. In his first tweethead in man dear the costs and first specification of the costs and first specification of the costs and first specification of the dissense of the first of costs and first, into the creater of the specification of the dissense of the true supplying the detection for all the costs of the cost

bem finit. Owing to the color of the crystasts; sowest estimation is saves a goost unit or me and their rengral form, it was believed that over emery. It has been used with great hour were continued of the hour and alumination, and thus it was that the new material was with great rapidity. num and thus it was that the new material was called orboundium, by combining the words carbon and communium. Later it was found by chemical analysis that curborandum is a com-

carbide of atticot.

The materials, used to the manufacture of colleges electrostances it would have been re carbranding as now carried out are sand, sait, coke, and sawdust. The sand comes from Ohlo, the sait from the sait works of Now York State, the coke from the bituminous cont lelds of Pennsylvania, and the sawdust from the mills of Torsavanda. When the visitor goes to the farrance building his first feeling is of turprise. The furnaces are of hrick, built up late four walls, forming a kind of rough the late four walls, forming a kind of rough brick box, no morter or cement of any kind being employed. Provision is made for five of these curious furnaces, each of which measures about fifteen feet long, seven feet wide, and six feet high. In the centre of each end whill air feet high. Its the contro of each end wall got the farmas p as large bronne plate, to which, are connected four large opper enhant. These cables serve to convey the current, which is empths from the wall-street or control the tempth from the wall-street or control to the beneath the factor. Connected with the inner surface of each of the large plates are sixty trabes rots, each of which is about turn feet long and these factors in disnotor. The rots form the tempth of the wall the plate are should be form the tempth. form the terminals. When the formace has been built up in thir way the mixture is intro-duced into it, about ten tons constituting a charge. Through the contro of the mixture a core formed -c ample craims of cuke is built. core formed of small grains of core is built, and sirves to make a continuous celetrical con-bestion between the two terminals. When the current is surned on it traverses this core and precapilly raises it to an enormous temand recently refer to its arrowness the one is a whork, house, allow files, reb stores, and recently refer to its an enrouse re-basines, at which the demand charge that produces real-persions takes place. The contract that the prince hallowed to cool down, but the contract that the prince hallowed to cool down. becomes major relation to that shows. The cuts and the thing present is allowed from the first three should be reported as well as the control of the should be reported as well as the control of the should be reported as well as the control of the should be reported as the should be reported

thinks, while the exposes of the process is must produced to the new place the distance because a corollage to the new place the distance become the corollage of the new place the distance because the term threates when the corollage of the cor

over emery. It has been used with great sub-coas in glass cutting, doing the work well and An interesting test of the grinding qualities An interesting test of the grinding qualities of carborundum was made by one of the great-est iron firms in America. A large roll of iron was meetly half an inch out of true, and under

cast, as the labor of grinding it down by means

FIRST CARBORUNDUM CRYSTALS OFFSAINED AT NIAGARA PALLS WORKS. thought that it offered an excellent opportu-

thought that it onered an excellent opportu-nity to put carborundum to a really severe test, so the mineral was used to turn up the rell. The result was highly satisfactory, for it was found that the unit was done in just onetwelfth of the time that would have been re-quired had emery been used. Carborundum is seld in various forms, such as wheely, hones, silvs, files, rub sto

writing:
If the pay modification of the process, possibly slower
action and an equation high temperature four main-tained, large crystals of this compound could be formed, we should have a beilliant gern added to our list of peculous ornamental stones. Its fine color, relegable administration being, and its hardness sail fit is ptendid adamantine lustre, and its hardness o o occupy a high place in the series of Jewela

p. Psychophotography.—That real images of objects are formed upon the human retina and persist temporarily seems to be proved by a series of experiments made by Mr. W. Ingles Rogers and described by him n the Amsteur Photographer for November 22, 1895. Mr. Rogers took a shilling and looked at it intently in ordinary daylight for fully a minute, with the idea of a fixing the image of it distinctly more the ratios. He then draw a yellow screen over the window of the nom in which he sat, so as to exclude all actinic light, and, placing a photographic plate in a certain position. fixed his eyes upon the center of it, at the same time allowing nothing but the image of the coin to security his mind. He remained looking at the plate for forty-three minutes and afterward developed it with the result that an outline of the coin was clearly shown upon it. The second experiment, made in the presence of three trustworthy witnesses whose testimony accompanies Mr. Rogers' communiention was still more remarkable in its result. In this case a postage stamp was substituted for the shilling. This was gazed at in a strong light for one minute. It was then removed and a plate put in its place and looked at for twenty minutes. The resulting "nsychogram," which is reproduced in the Amateur Photographer, lacked detail, but sufficient was shown to prove that the picture of an object impressed unon the retina can send out vibrations that will result in the production of an image upon a sensitized plate.

### 3330

TESLA'S NEW CURE BY SHAKING. The Electrician Has a New Davice for Giving

The Electrician Has a few Davice for Giying Jacy V Sexcles Without Sexrilla. (29) Nicola Tosla, the electrician, has different his inventive genius in a new direction. He has produced a machine which he culls an ozellator, and its object, briefly stated, is to produce a shaking up of the human sysem, threely causing cartain physical conditions which will result in the healing of

some allments.

He has also produced an artificial light

some attendate of the present of the

3928

E Wall EDISON'S SHREWD DEFINITION OF THE FINANCIAL TROUBLES.

EDISON'S SHREWD DEFINITION OF THE GROWNING THE PROPRIETS OF THE STREET OF THE PROPRIETS OF

3529

# SON'S SHIPS OF THE AIR.

A Startling Plan Suggested bu the Inventor to solve the Flying Problem.

HOW YACHTS MIGHT RACE AND FLEETS MANOEUVRE AMONG THE CLOUDS

A Telephone to Mars, Artificial Goms. Horseless Vehicles and South African Gold Mines Discussed by Mr. Edison. Nov 17

WW ( 1895

The results of the second of t



power to "event blotten and inventible chijoint had they need," and Mr. Politon, in his
chall way, when I need him about the least
that way, when I need him about the least
vention, to get the X way and to photographs,
vention, the thing is to turn that
weathern the thin the in the turn that
make a me of it that will be a hender and in
make a me of it that will be a hender and in
make a me of it that will be a hender and in
what a me of it that will be a hender and in
weathern the company of the company will be
surreach profession.
When the mean of Professor Resources's
way to be a surreach with the
gate departmenting with the rays, and were



# S'NOS SHIPS OF

A Startling Plan Suggested by the Inventor to solve the Flying

Problem.

HOW YACHTS MIGHT RACE AND FLEETS MANOEUVRE AMONG THE CLOUDS.

A Telephone to Mars, Artificial Garns, Horseless Vehicles and South African Gold Mines Discussed by Mr. Edison Nov 17

- 1895

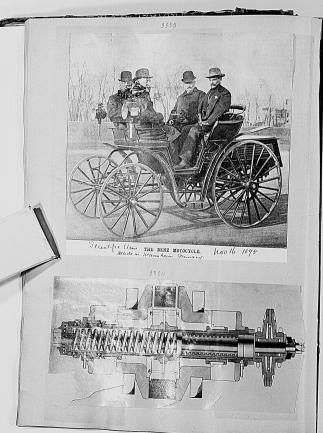
HOMAS A. LIPSON

Thas a evolution of the
fighter monitoring probless that it at once
that it

The trends of the with the complex. The trends of the complex of t

power to aveal hidden and invisible ob-feed is all very sleep, and Mr. Edison, in his chally way, leep, and Mr. Edison, in his chally way, leep and the product way was to be invisible, with the hing is to turn; that he invisible with the hing is to turn; that he invisible with the hing is to turn; that he invisible with the hing is to turn; the invisible way of the hings of the way had were dependent of the hings of the way had were dependent of the hings of the way had were dependent of the hings of the way had were dependent on the hings of the way had were dependent on the hings of the hings of the way had were dependent on the hings of the way had were dependent on the hings of the hings of the way had were dependent on the hings of the hings of





ELECTRICITY IN WARFARE. Sun dull 1896 DEALING POSSTRILITIES.

Werrible Engines of Bestruction Which Could Be Constructed Quickly and Himply and Against Which No Force Could Stand Up and No Defence Could Be Made-Water to Repulse Assaults-An-Aerial Dynamite Machine-Torpredo Cobles and Guns to Shoot Dynamite. Edison is distinctly a man of peace. War is not numbered among even the least of his de-

the and they are to be presented to be a second of the control of

person, but it's voltage that kills, and that it neatly reduced. The boller and dynamo could be lunged around in a non-borrer wagon. All you need besides in a powerful norm. Take haif a desired that have been a new service and the attacking force arranged on services and they attacking force arranged on services and they desired the services of the

times, it would be prefer there year for feetings, and in the control of the cont

to do that. That's the time it look to kill the dog."
Then Mr. Edison switched off from means of defence and talked about ways of destroying the essemy, over see a life-saving crew shoot a life line?" he wised, "Well, jest enlarge the

3338

ART OF DIAMOND MAKING

OENGES DIAMOND MAKING

GENERAL PRODUCTOR PART

ATTORISE DIAMOND MAKING

OENGES DIAMOND AND PROTEST

ATTORISE DIAMOND AND PROTEST

ATTORISE DIAMOND AND PROTEST

ATTORISE DIAMOND AND PROTEST

ATTORISE OF CORRESPONDING AND PROTEST

THE CORRESPONDING AND PROTE

the money was somes returned to their respec-tive money was some returned to their respec-defined the position, which this meaburtion will take among sent dealers, and there is little rea-son to fear that the ruby will loss the place son to fear that the ruby will loss the place will be a support of the returned of the manufact of Within a year of the return of these stones have been placed on the American market by sentime.

For the second control and the resident of the second control and the resident of profits of the distances in the second control and the

3330

3340

UNIQUE SYSTEM OF EXCAVATION.

3341

DEVICE TO RECORD SPEED.

An Invention That May Be a Terror to Scorchers When Used by Policemen. Scorchers When Used by Policemen. One of the inventions of the acason is a spredometer that records the rate at which a bicycle travels. It is a neat device, not un-like a cyclometer, that attaches to the front fork of a bicycle. A small rubber tired pulley

Herald Dec 25- 1897 CYCLE SPEED RECORD

All of the Mahatmas in the Desert of Gobi cannot produce wonders like those which may be seen and heard at the Electrical Exposition in the Grand Central Palace.

KOOT HOOMI and MORYA and .. CLAUDE FALLS WRIGHT'S Unknown would blush with humiliation and gnash their remaining teeth in impotent envy were they forced to contemplate the miracles of TESLA and ROENTGEN and likewise of THOMAS ALVA EDISON, of Llewellyn Park, New Jersey .- Editorial in New York Sun May 6th.

University's Exhibit—Main floor, West, aborical Exhibit—Main floor, West, aborical Exhibit—Main floor, West, affections Exhibit—Main floor, West, and the state of the state o

free. Electrical Cooking Lessons afternoon and evening

NOTE.—The POWER which operates the Ningara Falls Model comes over the wires of the WESTERN UNION TELE-GRAPH COMPANY direct from Ningara Falls. The rear of the Falls is transmitted over the long-distance wires of the AMERICAN TELEPHONE & TELE-GRAPH COMPANY from receivers placed directly at the Falls.

The things of interest are everywhere on every floor. Bleetire Pristing Presses here, Electric Boats there. Ricroslees Currings ten feet away. The Woman is formed to the principle of the start of the

Lightning seen and commanded in one centur; hidden power equally under control next room over.

So it goes. The wonders seem to get thicker at overy the control of the con

WEEK DAYS, II A. M. TO 10:30 P. M.

# GRAND CENTRAL PALACE

LEXINGTON AVE. 43d TO 44th ST., NEW YORK.

# EDISON SUES ON PICTURE PATENTS

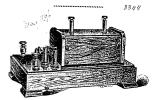
Many Actions Brought Against Those Who He Declares Infringe on His Kinetoscope Rights.

### HIS CLAIMS FOR ROYALTY.

Surprise for Manufacturers and Exhibitors, Who Thought There Was No Danger of Litigation.

LONG DELAY UNEXPLAINED. Metada Hill Help | PP |
Transas A Billian restorator prought inTransas A Billian restorator prought infer the Southern District of New York
for the Southern District of New York
greated service insorticisters and exhibitors,
some of the derivation of New York
for the Southern District of New York
for the Southern District
for the Southern Dis Herad Feb 24 1898

# Ruhmkorff Coils.



FINELY FINISHED IN POLISHED BOXES.

luaranteed as listed at the size of the CONTINUOUS park. An exceptionally high grade instrument. PRICES. -

14	inch						8.00	14	inch				50.00	
15							12.00	} 2	**		-	-	60.00	
5.8							18.00	2 34	**				80.00	
24	••						25.00	} 3	••				100,00	
	**		٠				30.00	} +	**				125.00	
11	**						35.00	} 6	**				347.20	
12	••		٠			٠	10 00	} s	**	-	-	-	416.68	
	Fr	otn	14	inel	ı to	1	inch inch	sive				Discour	nt.	

## STANLEY & PATTERSON.

12 & 34 Frankfort St., New York City.

3345

from Lip of the

What Is Tesla. (A) Of Nikola Tesla pops out once in awhile with the most startling discovery or invention. One day he is going to abolish all the arts the man statement of the beautiful the same of assessment, in man cause the same to look and a selective, the mast closes the same to look to the same of the same

Some of Nikola Tesla's startling dis-overies read like iridescent dreams.

3346.

Electricity in the Air. Eloctricity in the Arr.

Mellion (2g. <sup>62</sup> in U. E. D. Dow. Juff | [67]

It is a scientific fact that the stand-dayer condimens
more we have scientific at the stand-dayer condimens
arration of this truth by drawing remember of the condition of the truth by drawing remember of the condition of the truth by drawing remembers, they have been considered as the condition of the condition of the fact that it was necessary under the dash of several experimenters, they having use the condition of the fact that it was necessary under the condition of th

to have come protection in the shape of lambilities. These experiments have proved beyond death that electricity may be drawn from the attrosphere by the control of electricity is found when the attrosphere is the variable weather of the control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the attrosphere is control of electricity is found when the control of electricity is found when the control of electricity is found when the control of electricity is control of electricity of the control of electricity is found when the control of electricity is control of electricity in the control of electricity is control of electricity in the control of electricity is control of electricity in the control of electricity is control of electricity in the control of electricity is control of electricity in the control of electricity is control of electricity in the electrical potential. The control of electricity is control to each of electricity in the electrical potential is contained a extender continuous. In electricity is control to electricity in the electricity plays a control of electricity is control to electricity. It is possible to not control to electricity is control to electricity in the electricity plays a control of electricity is control to electricity. It is electricity in the electricity in the electricity is electricity in the electricity in th

to so relocad as to allow fix charge to be utilized to be so relocad as to allow fix charge to be utilized Normalius States and the sound of the normalius shows the current would be found too work of the normalius through the sound of the

All of the Mahatmas in the Desert of Gobi cannot produce wonders like those which may be seen and heard at the Electrical Exposition in the Grand Central Palace.

SHOW.

KOOT HOOMI and MORYA and CLAUDE FALLS WRIGHT'S Unknown would blush with humiliation and gnash their remaining teeth in impotent envy were they forced to contemplate the miracles of TESLA and ROENTGEN and likewise of THOMAS ALVA EDISON, of Llewellyn Park, New Jersey .- Editorial in New York Sun May 6th.

erreity's Exhibit—Main floor, West, frest Exhibit—Main floor, West, storical Exhibit—Main floor, West, elephone Exhibit—Main floor, West, alegraph Exhibit—Main floor, West,

Piectrical Cooking Lessons afternoon and evenin-

NOTE.—The POWER which operates the Nigara Falls Model comes over the wires of the WESTERN UNION TELE GRAPH COMPANY direct from Niagars Falls. The roar of the Falls is transmitted over the long-distance wires of the AMERICAN TELEPHONE & TELE GRAPH COMPANY from receivers placed directly at the Falls.

The things of interest are everywhere on every floor. Electric Printing Presses here. Electric Boats there. Electrical Boats the Eurosice Carriage ten feet away. The Woman is more than the big boilers downstairs. Edison's men work them the big boilers downstairs. Edison's men work them the electrical priories are shown by spatiar, mysterious Electrical Pictures are shown and the electrical Pictures are shown and commanded it had full. Chain Lighting seen and commanded it had full. Chain between small work contributes to more everywhere the electrical properties. power equally under control next room over.

power equally under control next room over. So it goes. The worders seem to get thisder at every turn. The life and light and spattle make it a very charming place indeed. "I could stay here for each said the handsoness woman in the building on Friday hands to be a source of the place of th

WEEK DAYS, II A. M. TO 10:30 P. M.

LEXINGTON AVE., 43d TO 44th ST., NEW YORK

# EDISON SUES ON PICTURE PATENTS

Many Actions Brought Against Those Who He Declares Infringe on His Kinetoscope Rights.

HIS CLAIMS FOR ROYALTY.

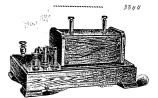
Surprise for Manufacturers and Erhibitors, Who Thought There Was No Danger of Litigation.

LONG DELAY UNEXPLAINED. Herad Feb 24 1898

Metad. His difference of the control of the control

Edison has brought suits from the control of the co

# Ruhmkorff Coils.



FINELY FINISHED IN POLISHED BOXES.

uaranteed as listed at the size of the CONTINUOUS park. An exceptionally high grade instrument.

Ý	inch					8.00	{	154	inch			-	50.00
16						12.00	3	2	"				60.00
,						18.00	3	2 36	**				80.00
i	**					25.00	3	3	**				100.00
	**	i	٠			30.00	}	4	**				125.00
1	, ee	-			٠	35.00	}	6	**		-		347.20
1/2		- 1	,	٠		40 00	{	8		-			416,68

## STANLEY & PATTERSON.

2 & 34 Frankfort St., New York City.

3345

Trom Lip of the touque.

38 4 5 5 White and the state of the state of

overies read like tridescent dreams.

3346.

Electricity in the Air.

There experiments have proved beyond doubt that is simple femion, all of which have been flow grade of the simple femion, all of which have been flow grade of the simple femion, and of which have been flow grade of the simple femion of the

3347

DOW JONES & CO., WALL STREET JOURNAL, DAILY MARKET LETTER. 42-44 Broad Street. Now York.

Telephone No. 646 Broad. Friday, January 8. 1897

No. 37

ELECTRIC SEPARATORS IN MINING.

Allentown special to the Philadelphia Ledger: Thomas A. Edison, with several prominent iron men, was in this city to-day. He has been at Catasanqua for several days making a series of experiments at the Crane Iron Works. This company lately purchased about 1,500 tons of briquettes from the Edison Mines, near Lake Hopatcong. These briquettes weigh about a pound or so, and consist of ore compressed into a circular shaped disc.

The cre is all of a low grade, and through the agency of a magnetic separator the ore is extracted from the rock, which has been reduced to a powder. The ore is called a "concentrate," and out of 5,000 tons of ground rock the result is about 250 tons of concentrate. This concentrate contains about 60 to 65 per

This week the Crane Iron Company commenced testing the ore, and Mr. Edison, accompanied by one of his assistants, Frederick Oit, is anxiously watching the result of the tests. Should the ore be all that is claimed for it this new method of mining will revolutionize the present method, particularly in regard to the low grades of ore found on the Lehigh Mountains. The leanest kind of ore can be worked at a profit under the Edison method.

9350

### IRON FROM LOW GRADE ORE. Success of Edison's Electrical Experiments in the Old Ogden Mines,

A common section of the common section of th

Y READY FOR QUARTERDECK.

Frank J. Sprague, a Former Naval Officer, Tenders His Services. 1978

NY-Heard

Frank J. Sprague, an electrical expert and former officer of the United States Navy, by

First At. algracus, an descripted report and provided and algorithms. Note that States Next, is ready to depend in Childred States Next, is ready to depen size the effective of the States of State

3349

# EDISON TRIUMPHS WITH IRON MAGNET

Secret of Drawing Ore from Earth Costs \$3,000,000 NY Pass - Od 29 1897 WILL AFFECT TRADE MUCH

Inventor Has Bought 16,000 Acres of Land on Which to Carry Out His Operations.

Thomas A. Edison's process of recovering By electrical means the iron contained ing by coexities means the non contained in low grande ores, the first authoritative in low grande ores, the first authoritative account of which is published in the Electrical Review, will undoubtedly have a far-reaching effect upon the from industry. throughout the world.

For the last elx years Mr. Edison has been working steadily to solve the problem which has so much commercial importance. which has so much commercial importance. His experiments have been carried on at the old typical from mines, a few miles from haver, N. J., and he has spent about thought of his own money to achieve suc-

The plant where the new process was tried first and then brought to perfection; was repeated acres of ground and is part of a tract of 2,000 nerve mound and is part of a tract of 2,000 nerve mound and is part of a tract of 2,000 nerve mound and is part of a tract of 2,000 nerve mound and is part of a tract of 2,000 nerve mound and the part of the ground and the process of the grade of the gra MAMMOTH MAGNET.

MAMMOTH MAGNET.

His plant, though more of an experiment station than a commercial cuterprise, is to-day capable of producing daily from 1,000 to 1,000 tons of ninost themically pure from. The extent of Mr. Edison's operations may be induced from the fact that he wave may be judged from the fact that he says be controls all the known tracts of magnetite, this low ore, in the United States, In spite of the strain of working out his

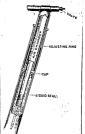
hundreds of bless and applying them to practical purposes, Mr. Edison has had time to purchase large blocks of land, until time to purenase large blocks of land, until the has accumulated 16,00 acres in New Land and the land the large land the large land to large large

pulverfixed rock.

HOW IT IS DONE.

In bird, his process consists in blasting the one from the mountain sides and then, by means of stram shovels and miniature sollies of the stram shovels and miniature sollies of the stram shovels. by means of stream aboveds and ministers with real results of early conveying it to minosiste contributed cars, conveying it to minosiste contributed and subsect of the contributed cars of the contr

3351

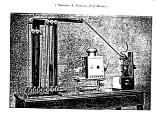


PREUMATIC SPRING SADDLE POST.

3353 EDISON'S CLAIM CONTESTED.
NYSUM — Det 31 1897
Capadian Inventor's Work in the Salms
Field and Ills Statement.

Tonoxio, Ont., Oct. 20.-A report has been the has invented a process for recovering by electrical means the fron contained in low-grade ores. Such an invention was patented five years upo in Canada. It has been in operation in Toronto for at least three years, and though as yet little has been though as yet little has been though it by State, the Goorge H. Patter-on is makentee and manager of the company which controls the working of the company which controls the working of the patterns o 3352

# The Perfected EDISON PROTECTOSCOPE



NEW MODEL, NEW RESULTS. NEW PRICE, NO RESTRICTIONS

The right is kinematic, to again with. If the sady street. Mr. Edison cult the marking by Properling Kinematics and Schauffer Sprine.

The pletures projected by this muchine are sharp, clear and realistic. The size of the projection on

The pletures projected by this muchine are sharp, clear and realistic. The size of the projection on

The pletters projects by this modulu arts sharp, clear and realists. The size of the projection on the series, in a distance of five, it, SIATACO. M. Dilbourie new device storted almost entirely the vibration which hereafore has been the principal effect in projection machines. The Projectionspot is easily set up and operation, Every instrument is accompanied with full instructions and distance. As shipped to purchaser, it is completely accomised for operation, result to

Dimensions of members (see in pronty for work, length, 2°, familish feet; width, 11 inches; height, with spool bank (mek), 2°, feet; without spool bank, 2° feet. Dimensions of packing race, PXENZS inches; weight, 120° to 55 pounds, 0°.

ars. Gross weight, 150 to 165 pounds, v: The essential advantages, then, of Mr. Edison's new numbing are its extreme cheapness, its outright. The essential advantages, then, of Mr. Edison's new numbing are its extreme cheapness, its outright. mines. There wrongs, he can see parameter 5.

The control of the c

is 3-100 each, for standard lengths of 30 feet, and \$700 each for \$24 foot lengths. Isls of titles and description or subjects an application. A film contains 16 complete photocraphic to each foot of length. The exposure of a should affine \$20 sett upon the nucleim's about 22 events, and as the films of this length are in the form of an entities bank, the customary nethod is to run a fill in the titlers continuously, making the total exposure on the serven about a minute and a half, the file-ion being complete. The Projectioners has film need and reds for exhibition of both the \$20 and the "short films."

33.5%

Experiments recently carried on in Gercany with fron-pickel alloys have produced ompounds with different coefficients of expansion varying with the percentages of the two metals used. An alley containing 45 per cent. of nickel was found to have the same coefficients of expansion as platinum, and the result was confirmed by that court of last resort in scientific tests in Germany the Reichsanstelt. This is a most impor-tant discovery, since such an alley can be used to replace platinum in the incandes Platinum has been used for carrying the current through the glass of the bulb to the carbon filament, and the fact that it has been the only conductor with the same coefficient of expansion as glass has hitherto rendered it indispensable.

3354 MEDAL FOR CHARTER DAY CELEBRATION MIN O

1817 Greenaere

requests the honor of your presence at the Semi-Centennial Electrical Congress

Greenwere on the Piscatugua, Eliet, York County, Maine. · July twenty sixth to thirty first, 1897. in commemoration of the

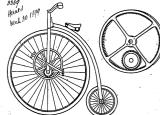
Virst Public Exhibition of an Electric Railway, by Mesos Gerish Turmer at Overs N.H. Inty 26, 1847.

Reception to American Institute of Electrical Engineers. Juesday, July twenty seventh from five to seven orleck.

3358

lamp recently devised by Prof. Nevnst, in which magnesium oxide is used instead of a carbon flamont, requires that the conductor should first be heated by either a Bunsen flame or the spark from an induction coil. Prof. Nernst proposes to embed a certain ment in the red of magnesium exide which will afford a path for the current 

some of the most recent experiments in wireless telegraphy have been made by Prof. Slaby, who has been able to send intelligible Morse signals 12% miles, using two balloons filled with hydrogen to elevate the end conductors 1,000 feet in the air. In this way he was able to transmit signals seventy times the length of his electric base line. Prof. S. P. Thompson, who spoke of these experiments before a British society, stated that in his opinion it was possible to develop the conduction or the induction me theds of wireless telegraphy so as to com-municate between England and India at far less cost than would be necessary with the employment of submarine cables. He was doubtful whether the wave method would be found practicable in such a case, as the ourvature of the earth would interfere with the propagation of the electric waves



NEW TYPE OF CHAINLESS BICYCLE.

NEW TYPE OF CHARLESS MOYOU.

Another now chainless begins has presented in element for the recognition of cyclic exports. In the investion of a New York husiness man, who believes his machine will describe the properties of the

## MAGNETIC IRON ORE SEPARATION.

A Day with Mr. Edison at His Exten-

your eyes some of the natty little briquettes and the only part that escapes is some dust of refined iron ore that he is shipping away which is rather pervasive. Even here, howto the furnaces. They have just come out of the oven, and are being rattled by the ry and bearings is a nulsance, and has been hundred at a time into the train of ears contreted only by extravagant labrication, waiting at Edison, N. J., to convey them. Mr. Edison makes the dust protect his oilto the yawning maw of fire down Belisheben feed on all the moving parts. At the scab of way or thereabouts. They are the concrete accumulative dust thickens it is rubbed off expression of many hopes and much work and the, oil reducts and the percess is so prise up in the Jersey hills depends are on the part of the great inventor for long steady and slow at each bearing that the very small. So they are in other lines of years past, and their story would be worth oil consumption is reduced to a minimum. telling, even if some lesser man had been The cruthed rock, as already intimated, engaged in their production. New lines of undergoes magnetic treatment as soon as it perspective are opening up in the iron industry, for at the very moment when this pose allows the ore to stream down from a. return will be large enough. It was upon country is beginning to export Iron to England, the recognized fields of production have been challenged by others more re-mote, just as the wheat fields of the East oven then still crusted with gangue. This

ore in Jersey, is only 100 miles from his to 93 per cent. oxide, and is "concentrates" away, and the foreign sources, like those of evidently with such leanness the possibiliidea has been haunting him for a long time, belt to the briquetting department. Here in his classic book on electric smelting and refining, states that more than 170 patents have been granted in the United States alone. But Mr. Edison, with wonted boldquettes, they absorbed water freely. Toness and brondness has lifted the subject never attained before, and made it univer-

tione, in the central unlands of Jersey patcong, he is working on half-a-dozer voice of low-grade ore, of a total length of a score of miles, and the dip of his needle promises workable material a full mile down from the roots of the trees he is felling to make sleepers for his mine railroads. These roads ramify like tenacles from the works, and at their outer endsaretweer three buge excavators digging steel lips int the billsides and delivering four or five tons of iron rock every minute to the skips on the train. Out on one of these bluffs, about to train. Out on one or tasses outsin, goost to be stripped of its superincumbent earth, you rate likely to catch him, dreamly meditating, a cigar-butt between his lips. Then you will go back at his invitation to the works and see the mills of the good grindling the rocks up in anything but a slow

way, in order that the iron may be freed for concentration from the feldspar gangue. Two hundred million tons of rock is here two hundred milital tons of the crushed and yield 60,000,000 tons of to be crushed and yiese 60,000,000 tons of high-grade concentrates. As the works can grapple with, say, 5,000 tens of rock a day, it is, obvious that the plant may still be running when the next century closes.

The first crushing reduces the rock to places fifteen isoher in diameter, and stee ploces fifteen inches in diameter, and step

by step it is broken down by the relia, until it is of a finences that parinits it to respond to the pull of the first series of magnets to

which it is subjected. At no stage is it bandled. Mr. Zelson despises mere manual labor, and sny that no man gets the most of long remain undisturbed, however, is A Day with Mr. Edison at His Extension with the Mr. Edison at His Extension of the Mr. Edison at His Extension of the Mr. Edison at His Extension of the Mr. Edison of the Mr. over, Mr. Edison scores. Dust in machine-

is small enough. The building for this purheight, across the face of a mile of magnets, by which the iron is deflected while the were thrown out of cultivation by the newer areas of the West.

Mr. Edison, standing on his miles of lean

of bo mesh to the inch the ore is from 90

market needing such Beasemer ores, while ready for briquetting. Every four tons of the Lake Superior deposits are 1,500 miles Africa, Spain, and Cubn, are further off. If ty of profit depends upon cheapness of ex-be can refine his ore magnetically, and thus traction and lowess of freight charges. concentrate it chemply, the item of freight The concentrate is delivered into storage, tips the scale against his competitors. This or can be taken immediately by travelling running like a sub-consciousness under all an entirely different series of processes come his work on the stock-telex, the quadru-plex telegraph, the phosograph, and the electric light. Not that he is alone in magnetic separation work, for Dr. Borchers, would render it best for shipment and most acceptable at the furnaces, where the blast is so flerce.
When Mr. Edison first shipped his bri-

> day they absolutely refuse water but will slephol, and they are thoroughly porous to the furnace gases. The loose dust is fed into mixers where a binding material in it is taken up, and the compound then goes to the thirty briquette machines, where under an enormous pressure all around the bri-quettes are turned out swiftly by the thousand, each weighing alightly more than a pound and measuring 1% inches by 3. Band conveyors pick up these briquettes and take them on a personally conducted tour around the furnaces adjacent for about an hour, where a temperature of 600 degrees Fahr. brings them to the breaking strain of the average American ple crust. When thus kiln dried, the tough little briquettes are ready for shipment, and one man at the spout end of the department, can load a whole train of cars with them very quickly. It is a fascinating sight to see the conveyor bring them down and to watch them dealt out like chips, clicking and rattling into each successive car as it is filled with one said that these briquettes now increase the per cent, over the ordinary mixtures of ore now in use, and that less fuel and less lime-

stone are needed.

The iron has been taken care of, but its The from has been taken eare of, out to companion rock, long since reduced to sand, is an item not to be overlooked. If the ore-milling works are turning, out 1,000 tons of concentrate per day, there will be 4,000 tons of a sand for elipsettion, and thus it comes to pear that the hung holes in the ground on.

not long remain undisturbed however to a dryness and a keen crystalline edge that make it desirable in building operations, in various industrial operations—and these melt away. The sand of nature is, it apside this crisp, sharp-edged, keen-set product of man; and manufactured and therefore

It has been catimated that the margins upon which the success of this great enterproduction, and while Mr. Edison is anylong years of work here, he tells you firmly kindred deposits of ore that the giguntle and he believes that upon such work as his ing success as producer and exporter may

2362 EDISON AS A BRICKMAKER.

N.Y.TYIDON & OCTO 1897 HIS MANNETIC ONE CONCENTRATES MADE INTO PARTE. MOLICIDES AND BARES.

THE STATE OF T INTO PASTE, MOULDED AND BAKED,

EDISON'S LATEST FEAT.

AYSON OF 18 O

Hew Both.

November 12, 1898.

DEAR SIR:

The Entertainment Committee take pleasure in announcing the first "SATURDAY NIGHT" of the Season for the evening of November 19th.

The programme, which will be a varied one, will begin promptly at ten.

Members desiring the invitation of a guest can have a card forwarded by leaving name and address of guest at

Members are limited to one guest card.

CHESTER S. LORD, Secretary.



Leter Talurday Sights.

The pleasure of the company of

Mr Char Batchele
is invited for Saturday vor 19 at 930.12 ll.

at the request of

Mr Olper Oans

Brank R. Lawrence

Chester S. Lord .

1898

house, are Parriel and Archivel House Parriel and Archivel House Parriel and Archivel House Parriel Trave of Inc. 9 (1984). House Parriel Archivel House Parriel Archivel House Parriel Archivel Archivel House Parriel House Parriel House Parriel House Parriel Archivel House Parriel House Parriel

duced, and curried at small cost by water transportation to femmers conclipaous to this lake ports. The furnaces east of the Allo-phents were compiled to depend on a few small, isolated deposits of Beasumer ore in the East and ever imported from breeline countries. The ore deposits of the Southern States, as well as the non-magnetic over of New Jersy and New York, see unsuitable for making their and New York, see unsuitable for making their

and Now York, we unusuable for making little met at selection at selection and the North Schotter at selection and the North Schotter at selection and the North Schotter for the North market, and many mills have ceased to operate. The condition is not a trivial one, for many

# THE IRON AGE.

THURSDAY, OCTOBER 28, 1897.

## THE EDISON CONCENTRATING WORKS.

[With Supplement.]

only partial success. Then the idea of magnetic concentration was taken up by a number of inventors, among

A number of years since the problem attracted wide - ducted at Llewellyn Park, N. J. Six years since work on a attention in the Eastern iron trade how to make available for transportation to distant furnaces the lower grade mines in the New Jersey magnetic belt. With unflinchmagnetic ores, of which considerable quantities accoming courage Mr. Edison and his associates have devoted pany the bodies worked at a number of points in New their means to the undertaking. Mr. Edison has himself York, New Jersey and Eastern Pennsylvania. The or- given the greatest part of his time and his efforts to the dimary methods of wet concentration by jugging had been tried at Chateaugay, Tillie Foster and other mines with which have been spent in exploration, development, ex-

It has been a marvelous and persistent struggle, not them Thomas A. Edison, whose first experiments were con-

Fig. 1.-The Giant and the Intermediary Rolls.

questions, but also against the adverse circumstances which grow out of the radical changes, economically, which have swept over the American iron trade. It seems which mave swept over the American fron trade. It seems certain that after years of experimenting on a gigantic scale the technical problems have been solved, and it is believed that a commercially profitable basis has been

reached.

There is very little that is showy, from the popular point of view, in the gigantic work which Mr. Edison has done during these years, but to those who are capable of grasping the difficulties encountered, Mr. Edison appears in the new light of a brilliant constructing engineer grappling with technical and commercial problems of the highest order. His 'genius as' an inventor is revealed in many details of the great concentrating plant which is now a harmonious entity. But to our mind originality of the highest type as a constructor and designer appears in the bold way in which he sweeps aside accepted practice in this particular field and attains results not hitherto ap-proached. 'He pursues methods in ore dressing at which those who are trained in the usual practice may well stand aghast. But considering the special features of the prob-lems to be solved, his methods will be accepted as those economically wise and expedient.

Mr. Edison, has 'started from the general proposition that a finished product of iron ore of the best quality and in the most suitable form for the furnaceman can be obtained at the lowest cost by treating on an adequate scale a large body of low grade ore. He holds that it is cheaper to quarry lean ore and concentrate it than to at-tempt to mine under adverse circumstances the limited bodies of high grade ore.

### Exploration

When Mr. Edison and his associates determined to develop the business of jutilizing low grade ores very little was known concerning the existence and extent of deposits



Fig. 15.-Plan of Ore Body at Edison.

of magnetite of this character. Being considered economically worthless, no records of their existence were kept. As a first step a systematic search was made. The belt in which magnetite deposits were known to exist was crossed at distances of 1 mile, from the St. Lawrence to far south of the Potomac. With a dipping needle of Mr. Edison's design explorers crossed the country again and again, their straight paths being about 1 mile apart. The movements of the needle had been interpreted approx-



FIG. 2. STEAM SHOVEL AT THE MINE.

Instacly by a large number of observations. Inflations by numgatic attraction of the presence of time over at our led to a close search, and when a body of numgatid result of the process of time over a time led to a obser search, and when a body of numgatid versult of the process of the pr

THE PARTY OF THE P

on, time is a very representation of the sign. the company is that at Dibon. The form of it, as disclosed by careful exploration, is shown in the accompanying sketch, Pix. 15. The extent of the body was developed by trenching every 100 feet across the strike of the deposit and taking samples at regular short internat. These tests indicate that the ore averages about 20 per cent, of rior; that the average which is about 200 feet and the total length about a consequent of the contraction of the contracti

### Mining.

Al Elisona very interesting departure from ordinary methods of uning or quarrying has been about units in it. Elison argues that the energy is the contract of the per cont. dynamical a 2500 per ton include that that of the calories in a ton of cond at 83 per tons. He holds that the minimum of words probles should be assigned to the expensive explosive. Pursuant to that idea, he uses the dynamic merely to sharter the rock. It is noted displacement and removal is performed by a powerful steam showed.

The idea governing the method pursued may be explained more fully. In operations of this character, where it has been necessary to finely disintegrate large masses, it has been customary to depend upon the explosive to bring the material to such a size that it could be handled easily by the ordinary crusher. This meant an extensive use of explosive and a minimum employment of mechanical effort in order to accomplish the result. Explained in another way, it meant the expenditure of a costly aterial to do work which could have been done by a far cheaper material. Mr. Edison uses dynamite merely to dislodge the rock and relies upon coal to reduce it. B the old method the rock had to be broken to 100-pound lumps and less by dynamite; by the method under discussion the rock is broken into 5-ton masses and less by dynamite and reduced to a powder by steam

A series of Euch holes 30 feet deep are drilled 8 feet agard, 15c takes in the hole Cutil now steam drills larve been such hole as hereword comparisor is being as when such hole as hereword comparisor is being as 30 foot hole, with an average diamont of the introduce an overlead wire cable, by means of the drillic and with states of the comparison of the cuting. This will serve to prevent delay and will preven the above continsion working of the drillic.

As the probability of the deposit that the deposit that of the deposit that the deposit the deposit the deposit that the deposit the deposit the

 top refuse is removed and placed between the tracks as the work progresses.

That inding of the character may be chengly done will be really appreciaed. He is probable that there ore and be really appreciaed. He is probable that there ore and be placed on care at a shade under 10 cents per four. Our material way of the control of the place of the control of the cont

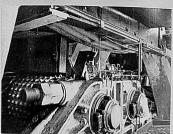
### Caushing the Book

One of the axioms in concentrating work has always been that the preparation of the ore must consist of progressive crushing, coupled with screening, and that is certainly the wisest course when the valuable mineral to be separated is easily floured. It is true, too, when water is used as the conveyor through the whole plant. But it is a different matter in dry milling, and when it becomes a question of handling cheaply enormous bodies of material possessing a low intrinsic value. Mr. Edison has shaken off the trammels of time honored practice, and instead of the costly screening after every crushing he passes the whole body of the material through a series of apparatus without attempting to size until he reaches the point when the actual operation of separation begins. In other words, he passes his rock through a series of crush. ing apparatus until he begins with a 14-mesh screen. This e prefaced as an explanation of the general scheme The general layout of the plant is shown in Fig 16. The first apparatus to which the rock is delivered are

### The Glant Rolls.

whose general appearance is well illustrated by our engravings, Fig. 1, and 6. The problem was of course, tohandle a somewhat extraordinary "run of a many so call it, with boulders runing up too." tow in may so call it, with boulders runing up too." tow in weight. The imperative necessity of hundling their material cheapity, without any hund labor or include or subsidiary work, makes it necessary that the crushing unachinery takes the rock as it comes. It reaches





the rock hosse in skips, shown well in one of our enterwings, Fig. 6. The tracks pass along both skips of the rock lones, the entire series of tracks being commanded by two overhead electric traveling cranes, which plot up the skips and deliver the rock to the plant rolls. The cranes have a capacity of 10 tows and a span of 20 feet, from the control of the control of the control to the control of the control

The giant rolls really partake more of the character of a rock cracker and constitute a new application in crush-

The rules are 6 feet in diameter, are 7 feet 35 fmelos part from centre to center and have a 6 foot fire. The latter is covered with a series of childed from plates betted to the roils. Prolegating from the plates are two selfest of 2 linck knobs on each plate, as is clearly shown in Fig. 3. Each of the gaint rolls, however, believe the first plate of the plate of th

The role are held driver. through friction, which consists of a strap, the grip or tension of which can be regulated a may be required. This is accomplished by a lever within convenient reach of, and resultly controlled by, the operator. The belt is not depended upon to all the operators. The belt is not depended upon to all the operators. The belt is not depended upon to all the operators of the liber at its top, as shown in the engraving Fig. 1, then around the left hand pulley, then up and around the right hand pulley and lack toward the left to the driving right hand pulley, and lack toward the left to the driving the hand pulley the pulley that the pulley the pulley the pulley that the pulley the pulley that the

When started the rolls are, in about 30 seconds, carried up to a circumferential speed of about 3500 feet, the mov-

up to a circumiceronia speed of anonit 3000 feet, the movining parts weighing 70 tons. Then the rock is dropped between them, absorbing a greater or lesser part of the energy stored in the revolving mass, until the charge has passed through. Then the rolls automatically speed themselves up again for the next charge of rock.

The crushed rock drops directly upon a second set of colls, called the "inferenciation colls," undernantit he giant-rolls, Figs. 1, 5 and 6. These rolls are d feet in diameter, with 5-foot face, the latter being equipped with knobs in the same way. Our engravings show these rolls, which are placed 4 feet 7/5 inches apart from center to center. They are driven by belt, on the other side. The capacity of the rolls is 300 tons per hour.

The engine which drives the rolls and the other crushing machinery which forms a part of this mill is a horizontal compound engine, rated at 700 horse-power, using steam at 150 pounds pressure, supplied by two boilers of the Climax type.

From the Giant rolls the rock is slowed by bushest conveyor to the first set of 6 fisher, 103, whose face, 30 inches, is lined with corrupated chilled iron plates, the order of the control of the control of the control of the Theorem 100 and the control of the individual control of the control of the control of the individual control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society control of the society gazar, and secure the advantage of positive driving, of which the chief is that grinding is obviously of the control of the control of the control of the control of the society gazar, and the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the society of the control of the control of the control of the control of the society of the control of the control of the control of the control of the society of the control of the control of the control of the society of the control of the contro

After passing through the first 35-inch rolls the material is delivered to a second set, of the same size and construction, the rolls being 37% inches from center to center.

Finally the material is delivered to a third set of rolls, 24 thebes in diameter and 20 inches face. These rolls are not positively driven, but are mounted against springs. They reduce the material down to ½-inch size and less. An elevator carries the crushed ore to

### The Bryer,

which consists of a lower 9 feet, square, 30 feet high, fitted with a series of cost from plates 9 feet long and finches wride, arranged like a "salmon ladder." These plates are placed one below the other, at an angel of degrees, facing alternately one way and the other. The ore sitted along the one, falling unfarted, the other three or sitted along the one, falling unfarted, to drop upon the next plate, and so on, until it is delivered to a bucket elevator. The drays is fired litter.

elevator. The dryor is fired direct.

The elevator No. 3 carries the dried ore upward, delivering it to a long conveyor which distributes it in a stock house 300 feet long and 75 feet wide, with a capacity of 10 000 tors of dried ore.

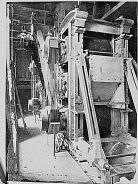
We note in this connection that the general arrangement of the plant divides it into three groups, of which each possesses complete independence of the others so far as operation for a considerable period is concerned. This is secured by interposing a stock house into which one department may deliver, at its own temporary rate, while the next draws from it as its requirements dictate. Speaking generally, the capacity of the third is rather greater than that of the second, and that in turn greater than the first. In that manner the final flow of product is independent, virtually, of any fluctuations in the operations of the first and second groups. The first fly wheel reserve of this character is the capacity for stock of 16,000 tons at the close of the operations in the crusher house.

THE PARTY OF THE P

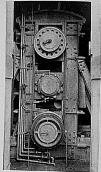
From the stock house the crushed material is brought to the bins above

The Three-High Rolls

in the concentrating building proper. The three-high rolls constitute another very interesting departure, by Mr.



Edison, from the usual appliances. The machine consists of three rolls, 36 inches in diameter by 30 inches face. The center one of these rolls is fixed. In other words, it is mounted in bearings which are rigidly secured to the housing in the usual way. The lower roll is driven from the main shaft through the intermediary of a wobbler provided with the safety bolts described in connection with the 36 inch rolls. The upper and lower rolls are free to move in guides formed in each side of the housing, as plainly indicated in the end view, Fig. 10. The bearings of these two rolls are of a flexible character and the rolls are free to play toward and from the center roll. . How



this end is reached will be understood upon examining Figs. 10 and 12. Each end of the roll is provided with a cylindrical sleeve which constitutes the bearing for the roll itself. This sleeve is formed with seven grooves for the reception of a wire rope 1/2 inch in diameter. This rope is wound about the sheaves thus provided, and makes seven complete turns. The ends are led upward and united over a single groove sheave, which is so arranged as to be operated by the piston of an air cylinder, The system consists of an endless rope passing several times around the ends of the upper and lower rolls, and the strain upon which can be regulated as may be desired by increasing or diminishing the air pressure admitted to the cylinder. Also, the pressure exerted by the upper

and lower rolls against the center one can be regulated to a nicety. A further and important advantage possessed by this system is what we may term its elasticity. This freedom of movement obviates all danger of wrecking

A further object gained by this design is the reduction of friction. The upper and lower roll bearings turn with the rolls, and revolve in the wire rope which constitutes the bearing proper.

The ore is delivered between the upper and middle rolls, and, as shown in the engraving, goes from thence between the middle and lower rolls. The rolls themselves are soft iron shells, the practice being to maintain their efficiency by frequent turning.

The pressure of the rolls on the ore is about 125,000 pounds, controllable by the air cylinder, and this pressure, unlike as in ordinary rolls, does not pass through the bearings; hence the efficiency of the rolls per ton of ore is incomparably greater than the usual type, as determined by measuring the power absorbed for crushing and the heat of the crushed ore deflected into a calorimeter.

The turning down of the rolls is done by an ordinary tool carriage mounted upon a bridge attached to the housing. When one set of rolls has become so worn as to require returning that particular set is driven through a speed reducing gear from the adjoining set, which is per-

forming regular duty. Worn out rolls are removed by the aid of a hoist traveling upon an overhead track, and new ones substituted by the same means. This is made possible, as the housing can be moved out of the way along the guides formed in the base, as shown in Fig. 10. The work of the rolls is watched by comparing samples of the product with a standard set, and the efficiency of the rolls for crushing is kept up by increasing the air pressure. The plant consists of four sets of these threehigh rolls, of which two are used for the crushed ore from the stock house and two for handling intermediate products from the concentrating mill.

a conveyor to an elevator, which delivers it to

in regard to which, again, Mr. Edison has departed from the usual practice, which has generally adopted the rotary screen. The point is made that the rotary screen has the tendency to wedge the particles more and more firmly into the slots, thus decreasing the efficiency. Ore particles sliding over an inclined stationary screen are apt to keep the screens clear. Besides, the wear with stationary screens is less, and the consumption of power limited to elevating the material to a somewhat greater hight. Mr. Edison places his screens at an angle of 45 degrees, delivering from one to the next, over which it flows in the opposite direction. Of these screens, which consist of screen plates 18 x 24 inches, of which there are five double sections, there are ten sets in all. These are of 14 mesh, The coarse material goes back to the three-high rolls, The fines are delivered to

### The Magnetle Separators

invented by Mr. Edison, so simple in principle and cheap in operation. When a thin stream of material is allowed to fall by a stationary magnet, those particles which are subject to magnetic attraction are deflected from their path toward the magnet. Two parallel streams of material are formed, one behind the other, which may be readily collected in different receptacles. The accompanying sketch, Fig. 17, illustrates the principle involved.

In practice, the magnets are arranged in series, one below the other, so that the material or tailings which have passed by the first magnet are brought within the influence of the second, which culls from the material a certain amount of magnetic matter for concentrates. Finally, the tailings from the second magnet are treated again by a third, fourth, or even fifth, according to the character of the ore under treatment. The final tailings have been so thoroughly cleaned of their iron bearing mineral that the work is completed. This sand is a marketable product, being used for building and a variety of other purposes. There is also obtained an intermediate product, con

sisting mainly of particles in which ore and gangue are intergrown. These particles, of course, yield to magnetic attraction, but can only produce a concentrate of moderate iron contents. Preliminary to further treatment this material must be crushed to separate the magnetite from the gangue, so that the magnetic concentrator may turn out a pure product.

These are the general considerations which underlie the magnetic concentration as developed by Mr. Edison. Returning now to the ore screened through a 14-mesh screen. This material is delivered to what is known as the 12 inch magnets, there being a series of three of them. From these magnets concentrates carrying about 40 per cent, of iron are delivered, while the tailings go to the

The concentrates which are obtained from the 12-inch magnets are delivered to a dryer, 6 feet square and 50 feet the dryer. high, fired direct. The dried ore is crushed in the threehigh rolls, the product being passed over 50 mesh stationary screens, five in a set, the number of sets being ten. The coarse material which fails to pass the screens is returned to the rolls for regrinding. The fines go to the 8-inch magnets, of which three in series constitute a ucts are made, tailings and concentrates. The former go to set, the total number of sets being 33. These magnets the sand house for further treatment, while the latter pass

waste heap, and assay about 1 per cent. in iron

deliver concentrates carrying about 60 per cent, of iron, whose further treatment will be described later.

### Eliminating the Phosphorus,

The concentrates from the 8-inch magnets are now treated by a special process invented by Mr. Edison, the object of which is to reduce the phosphorus. Mr. Edison found that the apatite, which is the mineral which introduces the phosphorus into the ore mixture, being so much lighter than the magnetite, may be removed by blowing a current of air through a descending sheet of the con-

From the three high rolls the crushed ore is carried by ore there is 1-1000 of phosphorus, in the fine dust blown out only about 3.75 to 4 pounds give 1-1000 of phosphorus; in other words, the fine dust clinging to the ore is twice as rich in phosphorus as the coarser particles of gangue. The cleaning of the ore serves also to produce better concentration in the final magnets. The dusting chambers, of which there are three, pro-

duce cleaned concentrates and dust. The latter is treated on magnets called dusting machines, which yield a fine



Fig. 17 .- Principle of the Edison Magnetic Concentrato

dust which is sold for paint, and final concentrates which go to the stock house

The dephosphorized concentrates are delivered to the last series of magnets, the 4-inch, which are mounted double. Of these, five magnets constitute a series, there being in all 64 sets. The products are final concentrates and tailings, the latter being returned to the other end of the mill and recrushed until all gangue is eliminated. All the concentrates are carried by conveyors to the stock houses Nos. 2 and 3, which hold, respectively, 5000 and 30,000 tons.

### The Magnetic Separators,

The 12 inch magnets have a cast iron core 4 feet 6 inches long, 12 inches wide, 4 inches thick, wound with No. 4 copper wire. Three magnets are put in series across a multiple are circuit of 80 volts. There passes through the three magnets 15 amperes. The first magnet of the series has less wire than the second magnet, while the second has less than the third, hence the strength of the magnets increases as the sheet'of ore becomes poorer in magnetite, the first magnet working on a 20 per cent. ore, from which it withdraws magnetite sufficient to reduce the ore to ? per cent. The sheet of ore then passes over the second emot which hoing somewhat stronger eliminates more gnetite, reducing the assay to 214 per cent. Finally the third magnet, which is very much more powerful, reduces the assay to less than 1 per cent. The tailings go to the waste pile. The three concentrates are mixed and go to

The 8-inch magnets are 4 feet 6 inches long, 8 inches wide and 3 inches thick. The wire is proportioned in the same manner as on the 12 inch magnets. Three magnets are placed in series across a multiple are circuit of 120 volts, 10 amperes passing through the series. Two proddown to the cleaning room. The concentrates assay 60

The ore then passes to the 4-inch magnets, which are 4 feet 6 inches long, 4 inches wide and 2 inches thick, all magnets are placed in series across a multiple are circuit of 100 volts, 17 amperes passing through the series. The 64 per cent, concentrate is separated into two parts by these magnets, one part being a final concentrate of 67 to 68 per cent., passing to the stock house ready for briquetting, while the other concentrate is about 35 per cent. This is returned to the other end of the mill and passes through the rolls and entire process, returning again for reconcen-

```
Intermediate Rolls
         Elevator No. 1
         First Minch Rolls
        Second 36-inch Rolls
        21-inch Rolls
        Elevator No. 2
        Elevator No. 3
       Conveyor to Stock House No. 1
 From Stock House No. 1 by Conveyor to
       Three-High Rolls
       Conveyor and Elevator to
       11-Mesh Screens
Pines to Course back to Three-High Rolls
    Third Magnet
   Second Magnet
   Third Magnet
 Fourth Magnet.
      To Rolls for
```

The annexed diagram will serve to show the course of per cent., which is increased to 61 per cent. after being the material through the crusher house and the magnetic oncentrating mill.

All the stationary bearings and all the gears, which runwound with the same kind and amount of wire. Five in oil, in the many departments of the entire plant, are lubricated from one central station. From this point extend lines of underground pipes to all of the buildings. At this place is located a pump which forces the oil to-tanks placed at an elevation in the different buildings. The oil flows by gravity from these tanks to the bearings. and back to the pump reservoir, which has a capacity of 4000 gallons. It is then purified and repumped over the system. The oil is fed to each bearing through a sight feed, a typical arrangement of the pipes being clearly shown in the two large views of the giant rolls. Figs 1 and 5. Each bearing is so incased that the oil, after having performed its duty, is caught by the case and from thence led back to the pump. The results of this method are to be found in the perfect lubrication effected, the doing away with all attendance beyond that necessary toregulate the flow of oil to each bearing by means of the cocks provided, and the elimination of all waste. These advantages much more than counterbalance the cost of installation.

Necessarily, in a plant employing conveyors to such a great extent it is essential to provide adequate and effi-cient means for lubricating the bearings of the wheels of the conveyor. This becomes the more important when we remember that these conveyors operate in an atmosphere charged with the finest dust of a material that is particularly dangerous if permitted access between any sliding surfaces. The problem then was to provide an effective method of oiling thousands of bearings, working under the most adverse surroundings, and which would receive attention only at comparatively long intervals, Not being able to eliminate the dust, Mr. Edison determined to make it do useful work, rather than mischief, and to make it form a barrier to its own entrance to places where it was not wanted,

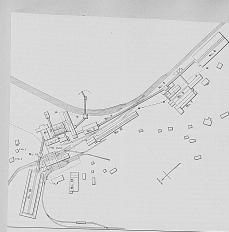
These conveyors carry their own axles, upon which are mounted flanged wheels running upon tracks. The outer side of each wheel was formed with a central threaded boss or hub, adapted to receive a cup. This cup effectually prevented any dust entering the bearing from that side of the wheel, as it completely inclosed the outer end of the axle. To keep the dust from admittance at the opposite opening was the next step. This was performed in a way as simple as it was ingenious: In the inner hub of each wheel was turned a flat recess about 1/2 inch deepby 2 inches in diameter. A pin was then placed through the axle in such position as to revolve in this recess, and the work was done.

The cup is filled with oil, and at the same time the pinand recess are dusted. The oil coming through the bear-ing moistens the dust, forming a paste which is evenly distributed about the opening of the bearing. By this method a dam is provided which prevents escape of the oil through the bearing and which also bars the entrance of dust. As the latter builds up the pin scrapes off a part of it, thus giving some oil an opportunity to escape.

The belief has been prevalent that Mr. Edison crushed the whole of his rock to a very fine mesh. It will be obthe whole of his rock to a very fine mesh. It will be ob-served that a very considerable part of the material is re-jected as tallings in as coarse a form as passes through a 14 mesh screen. In fact, the tailings from the first series of 12-inch magnets constitute 55 per cent. of the whole amount of material treated. The question how far the tailings should be deprived

of their iron contents is of course an economic one. Analyses of large quantities of them show that the iron contents have been reduced on an average to 1.12 per cent.

While Mr. Edison and his associates were working on the problem of cheap concentration of iron ore, an added difficulty faced them in the preparation of the concentrates for the market. Furnacemen object to more than a very small proportion of fine ore in their mixtures, particularly when the ore is magnetite, not easily reduced.



No. I. Jader and Eurine House No. 2, Ore Mill. No. 3, Stock House, Concentrates. No. 4, Concentrates Correyor, No. 5, Mir-in House, No. 19, Tamer House, No. 37, Crusher House, No. 9, Crusher House, No. 10, Conveyor to Green Mill. No. 17, Machine Shopt, No. 31, Procer States.

Fig 16 .- Plan of the Edison Concentrating Works.





The problem to be solved was to market an agglomerated material, so as to avoid the drawbacks of fine ore. The agglomerated product must be porous so as to afford acagglomerated promet: must be porous so as to afford ac-cess to the reducing furnace gases to the one. It must be hard enough to bear transportation and to carry the fur-nace burden without crumbling to pieces. It must be water proof, to a certain extent, because considerations water proof, to a certain extent, because considerations connected with securing low rates of freight make it necessary to be able to ship the concentrates to market in open coal cars, exposed to snow and rain. In many re-spects the attainment of these somewhat conflicting ends was the most perplexing of the problems which confronted We Palice. Thomself of Universitiests. Mr. Edison. Thousands of experiments were made until finally a satisfactory method of agglomerating the fine concentrate was developed. The work is carried on in

The Briquetting Plant.

trough.

By a belt conveyor the prepared concentrates are carried from the mixers to a scraper conveyor which runs between a long line of briquetting machines, 15 on each side.

The general appearance of these briquetting machines is shown in our engraving, Fig. 3.

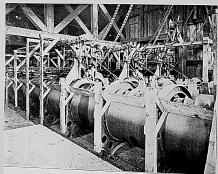


FIG. 14. MIXING BINDING MATERIAL WITH THE ORE.

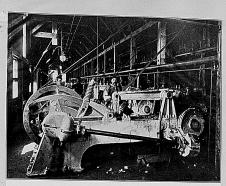
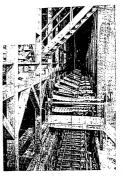


FIG. 3. BRIQUETTE MACHINES.



FIG. 13. CONVEYORS FROM BRIQUETTE OVENS (FIG. 9) TO STORE HOUSE.



The machine consists of a rotating die block 24 inches in diameter and 6 inches face, carrying 16 dies in which the briquettes are to be formed.

An ingenious method may be incidentally noticed, which has been adopted with marked success to prevent the ore mixture from adhering to the die and rapidly build ing up. By means of a jet of compressed air oil is forcibly ted into the dies from time to time, thus protecting the surface with a thin film of oil.

From the loose material in the hopper an adequate quantity is filled into the die, under a pressure of 800 pounds. The die then makes a sixteenth of a turn, stopping through an ingenious stop mechanism to receive a ager descending vertically, which exerts a pressure of 14,000 pounds. Another partial revolution brings the die with its partly pressed material before a horizontal plunger, driven by a toggle joint, in which a final pressure of 60,000 pounds is exerted. The machine produces 60 briquettes per minute, the dimensions of which are 3 inches diameter and Pf inches thickness. They weigh on an average 19 ounces each.

The briquettes drop from the machine upon a wire rope conveyor, so that whatever fine material drops from the dies is not carried along with the formed briquettes.

The briquettes are delivered upon a bucket conveyor which carries them into the baking furnaces. These are vertical shafts 22 feet high and 18 feet long, in which the conveyor with its charge makes five loops, the time of expasure to the heat being one hour and nine minutes. The formaces are direct fired and the temperature is maintained between the range of 400 and 500 degrees F., the same being recorded on large dials. Blast is furnished below the grate if needed, and a branch from the blast 15 furnaces, one for each two briquetting machines, and Peckitt. room is provided for three sets more.

The baked briquettes are delivered from the backet

the conveyor, Fig. 13, which delivers to the cars for shinment. Like all the conveyors in the plant, a short length is allowed to hang free, to furnish compensation for varying length of the system.

As for the finished briquettes themselves, their charcter is one which will prove eminently satisfactory to formacemen. They are so hard that even very rough usage does not cause them to break or to crumble. Their porosity is clearly shown by a simple experiment. They absorb a very large quantity of alcohol, trials having shown that the volume of the interstices is upward of 25 per cent, Their water proof character is made strikingly manifest : by watching how long water poured on the briquette stands upon it without entering it or spreading. physical condition of the material is certainly admirable for rapid and accommical furnace work

It may be of interest to refer to some of the

### Administrative Peatures

of the management of the plant. The three divisions of the works are each maker the control of a superintendent who is responsible for the results to Mr. Edison, who is the general manager. The man or men operating each individual machine are connected by wire with the headquarters of the superintendent of a department. If anything goes wrong they report by messenger. This brings the superintendent to the spot, who decides whether the case is one of minor repairs or adjustment which may be quickly carried out, or whether it involves more serious work. In the latter case he calls upon a corps of skilled markinists into whose hands the work is resigned This gang has instructions to immediately drop any other work upon which it is engaged when the call for repair work comes. In that manner the delay due to stoppage of machinery for repairs is reduced to a minimum

A thorough and complete system of accounting for the time of each individual machine has also been introduced. The man operating each machine notes the exact time of stoppage and starting, giving the reason for the idleness-These reports are collected and are tabulated, so that a full record of the causes is available, an analysis of which conveys lessons whose significance every works manager will readily appreciate.

### Beauty Obtained

Returning to a consideration of the plant in general, one characteristic feature is apparent, and that is that handling by manual labor is entirely done away with, The work is not touched by hand from the rock in place to the briquette in the car. In the mills there are employed in their operation 72 men per shift, and including mining and all others 125 men per shift.

The ore as it is mined averages only about 20 per cent. of iron, and it carries from 0.2 to 0.25 per cent, of phosphorus. As against that low tenor of iron it must be noted that the physical condition of the ore is very favorable to cheap mining and concentration,

Numerous analyses show that the believes

follows:	•				•	•	•	•	ľ	-	Ĭ	ľ	•••	••		٠	•••	•		•	•••	-
Iron Silicu													1		ı			n.		***		:01
Alterelma	***										٠.			*	te			-	i	KO)		41
Altendon		 •						٠					0.	٠	t		4	, N	Ť	41	111	31
Line							٠				• •	41	M.	3	4	•	0,	ш		N.	14	Ţ,
Megneda Sulphur		 						٠,	••			٠	•••	• •		• •					***	ĸ.
Sulphur Placehorus															٠.		٠				ın	w
Phophorus.				• •	••	• •	•						••			٠		٠.	٠.		tn	к
Resinous bimiler			•••	•••	•••	٠	• •		٠.		v	91	×	1	ю	n	ŖŦ	E1	т	4.1	64	711
Moisture		 					• •	*					••			3	,		P	CI	. 64	п

### The Briquettes in the Blast Purnace.

pipe is conducted above the grate, in order to lower the the Crane Iron Works, Catasanqua, Pa., by Leonard

The furnace at which the test was made produces from conveyor to a cross conveyor which runs along the lack mixture. The charging of briquettes was begun with a 100 to 110 tons per day when running on the ordinary coaveyor to a cruss conveyor which runs along too mack of the whole line of furnaces, as shown in our engraving, Fig. 9. This conveyor drops the finished briquettes to cont. The following is the record of the results: percentage of 25 per cent., and was carried up to 100 per

Results of Working Briquettes at the Crane Farnace.



11th the furnace had resumed the usual work on the regular standard ores. These figures prove that the yield of the furnace is considerably increased. The Crane trial was too short to settle the question to what extent the increase in product

may be carried. This increase in output of course means a reduction in the cost of labor and of general expenses. The richness of the ore and its parity of course affects the limestone consumption. In the case of the Crune trial there was a reduction from 30 per cent. to 12 per cent. of the ore charge.

Finally the fuel consumption is reduced, which in the case of the Eastern plants, with their relatively costly coke, is a very important consideration. It is regarded as possible that Eastern furnaces will be able to use a smaller proportion of the costlier coke and correspondingly increase in anthracite coal, which is a cheaper fuel in that section.

So far as foundry iron is concerned, the experience at Catasanqua, brief as it has been, shows that a stronger and tougher metal is made.

### Economic Considerations.

Now that the Edison plant has passed beyond the experimental stage, the question is uppermost what influences the enterprise is likely to exert upon the future of the American from trade. Let it be noted at the outset that from the standpoint of Mr. Edison and his associates it is not a question alone of the success of the individual plant which we have described. The plans reach further than that. There is in contemplation a works four times as large at a more favorable location, with others to follow. In other words, Mr. Edison and his associates are convinced that they will be able to assure to the Eastern iron trade an ore so cheap, and of such quality, physically and chemically, that the producers east of the Alleghany Mountains and north of the Potomac may be able to hold their own and develop in spite of the advantages which the iron and steel makers in the Central West and in the

It is of course a problem of quality and cost of the raw materials, of assembling them, and of the delivery of prodact to the markets. In the matter of labor the Eastern iron maker has a slight advantage, which is now counterbalanced by more modern and elaborate equipment in the West. The assurance of a bright future would onlebly place the Eastern works on an equality as to the latest plant, since that is merely a question of capital, which will be forthcoming if the capacity to compete is established.

On its channest over of Bessemer grade, the Mesaha.

Pittsburgh pays freights aggregating \$2.38, the rate from mine to shipping dock being 80 cents, the lake freight to lower ports 60 cents and the rail hand from lower ports to the furnaces being 98 cents. To this must be added the cost of mining and the royalty. Since it is possible to use only a moderate quantity of these cheapest ores, the cost is correspondingly advanced, so that 514 cents per unit is probably as low as can be figured.

The chief advantage of the Pittsburgh district lies in its coke, which may be placed at \$1.70, delivered, per net general sales agents. ton, or say \$1,55 per ton of iron produced, a fuel consumption of 1800 pounds being accepted as a good average for all year work on Bessener pig. Against this the East must pay an average of \$2.65, delivered, for the inferior Mountain, West Virginia and Reynoldsville cokes which go to its furnaces, Connellsville coke when used costing 30 to 40 cents more. With these cokes a consumption of 1900 pounds would probably represent good practice, making the fuel cost \$2.52 per ton. In the matter of coke, there-

fore, the Pittsburgh district has an advantage of about \$1 per ton of iron, against which must be placed the freight on product from Pittsburgh to Eastern points. So far as the latter is concerned the trade generally is in the dark. It is freely charged that special rates are made, while the Eastern local rates to consuming points are relatively very

It is suggested that the Eastern furnaces possess in anthracite a cheaper fuel than coke. It is true that in eastern and central Pennsylvania anthracite is available at many points at \$2.15 to \$2.25 per gross ton, and that, although a larger quantity must be used, the direct fuel cost is a little lower. But anthracite is far from being an ideal furnace fuel. Against the lower price there is as an offset that the same tonnage cannot be getten out of a furnace, which means higher labor, enhanced general costs and a heavier interest account. Still, under certain circumstances there is a slight economy in its use.

Against this must be noted, as an advantage in the case of the use of Edison briquettes, that they are very easily reduced in the furnace on account of their physical condition. The Crane trial, while not conclusive enoto give numerical expression to this fact, does show that it is a factor which Eastern furnacemen may count upon as being in their favor

The Eastern works cannot compete against the plants in the Central West by using lake ores, because they must pay about 37 cents per ton of ore more for rail freights from receiving ports than the plants in the Pittsburgh district. This is equivalent to about 65 cents per ton of pig iron. Nor can they, with a duty of 40 cents ner ton, rely upon foreign supplies except under special cir-

Therefore they must look to a local supply of ore as a matter of necessity. The promise of such a supply is what is now held out. It is believed that with the aid of the developments which are now culminating at Edison the Eastern iron trade may be placed on an equality with that of other sections

It has been urged by some who have had occasion to study the plant of the New Jersey & Pennsylvania Concentrating Works that the wear and tear of the machinery will be excessive. We know that the most liberal estimates on this point form a part of the cost of product, and we are advised that the latter is low enough to allow a good margin to the works and give substantial backing to consumer in his competition with other sections.

There are possibilities of one interesting phase of development, and that is in the direction of the production of cheap low phosphorus material. There has been a growing tendency among consumers of Bessemer steel, and notably among rail buyers, to crowd down the phosphorus limit. Now the quantity of ores low enough to produce such a steel is very small in the West, and their price is high. In the East the supply is confined to the Cornwall hills, whose ores possess certain drawbacks, Mr. Edison's results held out the promise of ample supplies of raw material suitable for making low phosphorus acid Bessemer steels, which might divert important business to Eastern mills.

The iron trade will watch developments with the beenest interest. We understand that the product of the Edison plant will be placed on the market at an early date. The officers of the New Jersey & Pennsylvania Concentrating Works are Thomas A. Edison, president: W. S. Mallory, vice-president, and J. F. Randolph, secretary and treasurer, the general offices being at Orango, N. J. Pilling & Crane, Girard Building, Philadelphia, are





3367

Cleetrical Neview Oct 14 1897

#### EDISON ORE MINES. SUCCESS FINALLY REWARDS THE EFFORTS OF YEARS.

AN INTERVIEW WITH MR. EDISON-DESCRIPTION OF HIS VAST WORKS MENSE FORTUNE EVIDENTLY TO BE REALIZED AFTER AN EXPEN-DITURE OF NEARLY \$3,000,000

#### A TALK WITH EDISON AT HIS LABORATORY.

I was told that I might find Mr. Edison too much absorbed to take any moments from his work, as these were very busy days with him, for the development of this herculean task of electrically taking iron ore from the earth was occupying his mind, but that during these October mornings, while at Orange, he reached his laboratory at five o'clock. With this in mind I went to his laboratory something before eight o'clock, and in answer to my inquiry his representative said : "He is very late this morning, but I believe he will soon be here," and I was ushered into a large library, surrounded by tiers of upper galleries, the furnishings of

which were presented to him some years ago by his employés, and where he spends many of his studious hours. The spacious galleries are filled with a wide range of books of reference and records along the lines to which his life is devoted.

After a few moments of watching I saw a figure tradging slowly along the path near the outer gate, and Mr. Edison appeared with his head inclined downward apparently in deep meditation. He was clad in a long blue frock coat, and wore on his head a light slouch hat such as is commonly seen, though this carelessly hung on his head. I could just imagine, as he crossed the large hall to greet me, that this unusual thoughtfulness was evidence that, now the question of furnishing the world's supply of iron had been solved to his satisfaction, his powerful mind was concentrating on other problems which, like this, had been pronounced unattainable

"Yes," he said, after he had read my letter of introduction, "I believe that this piece of work is thoroughly developed. You have seen the plant, I suppose? Well, every operation

and every process is now on a practical basis, and I think my work is

After some additional explanation, which Mr. Edison made about the deposits of iron ore in New Jersey and the scarcity of iron ore, which has been disturbing the mills of the East, he outlined the work to which he has been for nearly eight years devoted. It is simply applying on a scale of many thousands of tons a day, the principle of a magnet drawing the little black particles of ore from the pulverized rock. The obstacles to be overcome, even to a developed scientific mind, seemed insurmountable. The magnetic survevs, which were made under his direction by several corps of men, included a whole strip from lower Canada to the Great Smoky Mount-

ains of North Carolina, for the pur pose of locating the best deposits of

Returning to the subject of the principles involved, Mr. Edison took my pencil and said: "Let me show you the principle of the magnet operating on the iron and the refuse sand after it has been pulverized from huge rocks of many tons weight," and

with this remark, made the little diagram which is here reproduced. The explanation is apparent, for as the crushed product falls from the moving belt the immense system of magnets, which are sufficiently powerful, if the total of their attractive force could be



THOMAS A. EDISON, FROM HIS FAVORITE concentrated, to lift the largest can-

non, are drawn inward, and the dust or other elements not being affected by the magnetic system, keep the natural gravity and are separated. In response to a question, Mr. Edison said that he believed that this would prove the most important work of his life, as its effects would be so far-reaching in increasing the supply of iron materially, and it was evident to the interviewer that the subject to him was a very pleasing one for dis-cussion. The huge steam shovel, of which the company organized to carry on the work of Edison has the largest n the world, is capable of eating into a mountain like a huge gourmand, and passing the material on for refining. The picture of Mr. Edison, herewith presented, is from a photograph made at Shamokin, Pa., 12 or 15 years ago. It is the picture by which Mr. Edison prefers to be known, as it was taken when he was in the prime of life and expresses a certain intens-ity and strength of character which succeeding years have tended to soften into perhaps a more gentle and be-nign character. When he presented the picture, on which he had put his utograph at my request, he said it ad never been published. S. H. GODDARD. Orange, N. J., Oct. 26, 1897.

A DESCRIPTION OF EDISON'S ORE MINING PLANT.

Within 100 miles of Greater New York,

Thomas A. Edison is performing a task the agnitude and simplicity of which can be appreciated only by personal investigation, Mr. Edison's apparatus is literally chewing

Mr. Edison's apparatus is intermy crossing up mountains.

Not only this, but he is utilizing a many mountains.

Not only this, but he is utilizing a many mountains.

Not only the considered absolutely uncleased the significant continues the significant continues. He is going to make a whole lot of money out of this material that no other manufacture can afford to even consider, and he is doing it a ter a fusition that is practically perfectly automatic.

The old "Ogden from mines," In the present of the Revolutionary War. They were never to all interest and purpose a handment. About eight years ago, Mr. Edison acquired aggregating never to all interest and purpose a handment. About eight years ago, Mr. Edison acquired aggregating never the present of the present of country is composed of mountains of magnetic, which is a low-grade iron ore.

He has sucreeted, Bittered with the fittle settlement of "Edison" is Bittered with the vidences of failure upon the control of the fittle settlement, machinery of elementary sim, 1900 to 1,500 four of from turn out from 1,900 to 1,500 four of from the fittlement of the fittlement of the fittlement April Mr. Edison looks over the plant and April Mr. Edison looks over the plant and fit get there on what fix after your settlement of fit get there on what fix after your settlement of

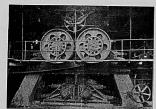


411111 Ja Edison oct 16.97

Sand Ore

SKETCH DRAWN BY MR. EDISON FOR THE "ELLCTRICAL REVIEW" TO ILLUSTRATE THE PRINCIPLE OF MAGNETIC

All V. W.S. Mallow, who is the right hand of the W.S. Mallow, who is the right hand of the work of the



THE GREAT IRON-ORE CRUSHING MILL AT EDISON, N. J.

carrying on the average about 25 per cent of iron. The ore resembles gray rock in appearance, and is so soft and Iriable as to be until for building purposes or even for maximal for building purposes or even for maximal production of port of the production of production of production of production of the pr

A complete and accurate magnetic survey A complete and accurate magnetic survey of the property has been made, and shows that the ore bed trends from northeast to tant the fore not trends from northeast to southwest, covering an area about 12,600 feet long and from 50 to 600 feet wide. The ore averages very close to 25 per cent iron, and Mr. Edison says there are on this prop-erly 250,000,000 tons of it, or 50,000,000 tons of iron. It's object in life for the past six years has been to recover this ore at a profit. His fertility of invention is shown by the common of the belief to bonnes it as odd abandones of the belief bonnes it as odd abandones of the belief of the

means in another way that he owns 4,000 acres of almost churkally pure iron. The own at the Edison, N. J., tract alone is sufficient to produce 1,000 to 1,500 coss of iron every day for 100 years to come, "Comblerthis," said Jr. Mallory, pointing to a map. "Here we have over 16,000 acres of magnetic located near the converging counce boundaries of three slates. verging couner houndaries of three states. That's the raw material near at hand. Over here in Pennsylvania, but a few miles away, we have the immense amthractic coal fields. That's our fuel, and it's so near as to be almost at the door. Below the coal fields in Pennsylvania is a great collection of blast Pennsylvania is a great collection of blast furnaces. That's our market forour fluished product. The thing is almost ideal in its surrounding conditions. The three vital elements of the iron business are located at the angles of an equilateral triangle, all

Mr. Mallory to the ELECTRICAL REVIEW representative who was visiting Edison. "We'll walk up this narrow gauge track to where that big steam shovel is at work.

is where that hig steam showed is at work, where that hig steam showed is at the interception of the inter track, and do it all in 10 seconds. He's a wonder. He has a little brother working further down the line, but he's only a 60

processing the process of the process of the project and months outlier or most down, and the process of the pr

up. Over each track is a powerful electic cance, which pick up a skip and in a trice dumps it contents into the hopper, where the popular like a fish, crushed between the popular like a fish, crushed between the start of the start of the start of a carbon cone mill to another by neuros of an elaborate system of best and the start of the star

to drop down through a long series of obetro-magnets.

A wooden partition is so arranged that the iron, attracted by the magnets, is deflected to one side, while the sand, being mon-magnetic, falls by gravity to the other side of the partition.

A separate system of conveyors carries the sand off to one side, where it is decree

Ited in a benp, forming a little mountain by ited. There is a rendy sale for the sand, which is fareful as a rendy sale for the sand, which is fareful as purposes, for which it is innounly well salapted. The fros, in the mentilme, has been dragged up in the sir again and is allowed which thereughly drys; it. On reaching the level of the earth another system of conveyor carries in 01 to the "integretting" plant, where it is mixed with a "budner," so limited in the property of the property o

into it may be really moduled into higherent.

In the second of the seco

processing a speed can you need the throughout the mean processes? To the stape as they attend along-state that they are attended as the state of What speed can you acquire through-

which we have found to be a very liberal of the continued, and the continued, and the continued, and the continued, we use 'safety plase in the shatting. This is a device which Mr. Eldosa invented to correspond with the safety fine in electric to correspond with the safety fine in electric to correspond the continued of the continued of the corresponding to the continued of the corresponding to the continued of the continued of

safety plus before any disease; could his account of the count of the

3368

### EDISON, JR., WIZARD.

Son of the Famous Electrician, Sent. Forth to Shift for Himself. Astonishes His Father,

### HAS INVENTED A NEW LAMP

He Is Developing a Formidable Rivalry to His Illustrious Parent in His Own Line.

YEARS IN THE LABORATORY.

Under Father's Tuition He Absorbed All the Details of Electrical Science

and Construction.

Thomas A. Edison has need to look to his lauvist. His son and nameaske, son forth from the shelice of the paternal roof and beyond the induces of his paternal guidance, extended the state of the paternal guidance, extended the state of the

whereast may first of twice the age have with mach interest to when the mine of Littles in familiar have were heard or Littles in familiar have were heard or Littles in familiar have were heard or Littles in familiar have been a large to the large twice of Littles in the Little have started the world. For years he has been a large to the large twice of his father, these incubations of myserious things the large twice of the father these incubations of myserious things the large twice of the father. However, the large twice the large twice of the father these incubations of myserious things the large twice of the father these incubations of myserious things the large twice of the father these incubations of the large twice twice the large twice twice the large twice the large twice the large twice twice twice the large twice twice the large twice twic

tient. Good morning."

So the NOTICE IN BROADWAY.

So the William is started out, four mon ago, with our grant ago, with our grant ago, with other control of the start of the dearn to make, himself, heart in the worlders to make, himself, heart in the four till an analysis of the start of t

N.Y. Hovard Dec 5 1897

A. T. S. C. S. L. S. C. S. C.

3369

or extracting gold from gravel. The inventor's success with ore separators has been so striking that we may yet has been so striking that we may yet have a process for extracting sillineas from an Auntle. There would then be no bi-product left, which would be a blessing.



3368

STATEMENT

# ELECTRICAL SHOW Opens This Evening at 8.

MADISON SQUARE GARDEN.

### SNAP SHOTS OF HUMAN THOUGHT

Edison, Jr., Declares He Has Traced the Outline of Impressions of the Human Mind.

CABINET OR PANEL SIZES.

Young Experimenter Operated on a Man Who Could Think of a Quarter of a Dollar.

HE MUST MAKE MONEY FIRST

After He Gets Rich and Perfects His "Thinking Machine." Look Out for Your Thoughts

Guard well your thoughts when you are with Edison, Jr. They may be photographed. This warning is given on the assertion of Edi-son, Jr., who declares that he has photographed a human thought. He maintains that with the aid of the N ray, hypnotism, a that with the aid of the X ray, hyporolism, a hard thinking man and mysterious appli-ances whose secret is he alone and carefully guarded he has succeeded in transmitting to a highly sensitized film the outline of an ob-ject on which a human bring's mind was cen-

Describing all this with an air of dation, the experimenter predicts wonderful achieves the experimental products wonderful achieves a staff or the present to thank anything you like whys, ho is around, because thus far he was to be a thought and would not know what it was unless interpreted to him. And there he must not be a thought and would not know what it was unless interpreted to him. And there he must not be a supported by the staff of the staff of the work of the staff of t

trending out blong which promote financing feetings much so to fir any place of party of the control of the con



First of all le mode a few verte with hytered a character la mode of few verte with hytered a character la mode of hybrid processive
and a character la mode of the mode of
control and the character la mode of the
control and the few of the based of the
control and the few of the based of the
control and the few of the based of the
control and the few of the based of the
control and the few of the based of the
control and the few of the based of the
control and the few of the based of the
control and the few of the based of
the control and the few of the control
to a mode of the few of the control
to a mode of the few of the control
to a mode of the few of the control
to a mode of the few of the control
to a mode of the few of the few of
the control and the few of the few of
the control and the few of the few of
the control and the few of
the few of the few of the few of
the few of the few of the few of
the few of the few of the few of
the few of the few of the few of
the few of the few of the few of
the few of the few of the few of
the few of the few of the
the few of the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of
the few of

"I sould believe the Archaela."

"I sould believe the Archaela are resulting to the Archaela are resulting from the Archaela are resulting from the Archaela are resulting from the Archaela are resulting to the Archae

Non-they are above, Tanks of your quarry.

Non-they are above, Tanks of your quarry.

While be wan been coverage has a subject use
of the wire places, gr., which is a subject use
of the wire places, gr., which is a subject to the control of the time in registered the
indicators quarry of the time is registered to the control of the co

"Think of a waterer" a fine department, and a fine a fine

3341

EDISON TALKS OF PATENTS. PRACTICE OF THE COURTS.

Inventors of Remulationising Processes of Ma-chinery Sure to Meet Great Bulleuity in Frighting Infringers-Loreng Beelays in the Caurts and Cestly Preservations. Thomas A. Elison has taken out probably more patents than any other inventor. Ho owes his fortune and list fame to seem of them.

more positive has any other hyrother. He has been greater from only piching greater for the has been greater from only piching greater grains as a larger. Naturally has been been grains as a larger, Naturally has been been grains as a larger from the picking and carry consistent of the picking and carry consistent of the picking and pic

The varies or a patent," Tay's the Jiaventor, "diminishes in the ratio at which the value of the thing patential decreases. That is to asy, it is man gets up a patent on a wronch, that y patent has a rest values and may be profitable; but it has a rest values and may be profitable; but it has a rest value and may be profitable; but it is a rest value of the profitable than a rest value of the profitable than the profitable that it is value to the world at large, that patent is value to the world at large, that patent is value to the world at large, that patent of the procedure of the court.

STATE VALUE OF THE PARTY OF THE

The court.

The court is a second of the court is a second of an about the court is a second of the court is a second of the court in t

The state of the control of the facility are writtened by the control of the cont

NY Son Sec 26 1897. SUNDAY, DECEMBER 26

HIS GENIUS PRODUCED GUNS. he Inventor of the Springfield Ritle Afterward Made Arms for the Confederates.

The action of the formation that the control of the

33/4

Mir

Mew Merk Electrical Society

extends to you are invitation to be present at the equing of the Electrical Exhibition,

Mis Excellency the President of the United States

Mix Excellency the Vice President, by combined phonograph telephone, telegraph, etc.

> on Monday, May second, eighteen hundred and ninety right, al eight vilock in the evening.

Hen Chauncey M. Defect. Prosiding.

Mudison Square Gurden. Sew Hork City.

Continuation of the Symmetry des Symithes do notedated nogratify, estanto 9% 3845

The Grolier Club

Str. Charles Batchelder

and thuses the pleasure of his company on the eleming of Athursday
"March the third, 1898, at nine o'clock.

88<sub>2</sub>%

### American Geographical Society,

No. 11 West 29th Street.

New York, March 15, 1898.

SIR

I have the honor to inform you that at a regular meeting of the American Geographical Society, held on the evening of March 1444 you were duly elected a Fellow of the Society.

You are cordially invited to make use of the Library and Map Rooms of the Society. Office hours, 10 a.m. till 5  $\nu$ .m.

The initial payment and dues of a Fellow for the first year are \$10; and the dues \$10 yearly thereafter; Life Fellowship, free from all dues, \$100. Please remit the amount (\$10 or \$100) to the Treasurer of the American Geographical Society, at No. 11 West 29th Street.

Very respectfully, Aven

Recording Secretary.

To Charles Batchelor Esq. 33 West 25 4 Stant-

3343

Columbia University Teas 18.98

3348

#### AMERICAN GEOGRAPHICAL SOCIETY

Meeting, MONDAY Evening, December 12, 1898. AT 8.30 O'CLOCK,

CHICKERING HALL, COR. 18TH ST. & FIFTH AVE.

#### MR. COSMOS MINDELEFF Will deliver a Lecture on

American Aboriginal Architecture in the United States, Illustrated with Stereopticon Views.

THIS CARD WILL ADMIT TWO PERSONS.

### SON, SR., TALKS BOUT EDISON, JR.

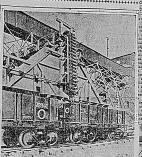
d Is Not at All Startled by the Inventions of His Hope-E CARRIES HIM THROUGH

No Remarkable Improvement in the Young Man's Incandescent Lamp.

an and described by him as a radical tent, does not inspire his father with

VEMBER 29, 1898.

# EDISON'S WAND DEFIES A TRUST N.Y. Journal Nov 29 at Edition, schoffler's





Wizard Stronger Than Iron Ore Monopolists in Eastern Markets.

ELECTRICITY HIS TRUMP.

at Edison, that is done I can

The Officers of the Departments of Astronomy, Mechanics and Physics and of the Division of English and Literature request the pleasure of your company in the Physics Building on the afternoon of Saturday, the sixteenth of Sprit; from three until six oclock.

One hundred and sixteenth Steet. between the Boulevard and Amsterdam Seenar

The Officers of the Departments of Civil Electrical Mechanical and Mining Engineering request the pleasure of your company in the Engineering Building on the afternoon of Saturday the sectionth of Speed. from three until me victorie.

One hundred and sixteenth Street. between the Boulevard and Amsterdam Seena

3348

### AMERICAN GEOGRAPHICAL SOCIETY

Meeting, MONDAY Evening, December 12, 1898, AT 8.30 O'CLOCK,

CHICKERING HALL, COR. 18TH ST. & FIFTH AVE.

#### MR. COSMOS MINDELEFF Will deliver a Lecture on

American Aboriginal Architecture in the United States. Illustrated with Stereopticon Views.

THIS CARD WILL ADMIT TWO PERSONS.

### EDISON, SR., TALKS ABOUT EDISON, JR.

Wizard Is Not at All Startled by the Inventions of His Hope-Herai Iul Son. Jan 14

NAME CARRIES HIM THROUGH

Finds No Remarkable Improvement in the Young Man's Incandes-

Whatever success Thomas A. Edison, Jr., may have had in attracting attention, he has of his attention attention, he has of his altitudinable father. Edison is still conducting the hustness of wizard at the old in son from after with undustried calin. While he is not displaced at the fone of licens, Jr., he is by no means ready in addition. The has been displaced at the fone of a contract of the little of

The new incendescent lamp invested by the young man and described by the his a residual property of the proper

Measure, with impbell's Sure eality.

COL. INGERSOLL.

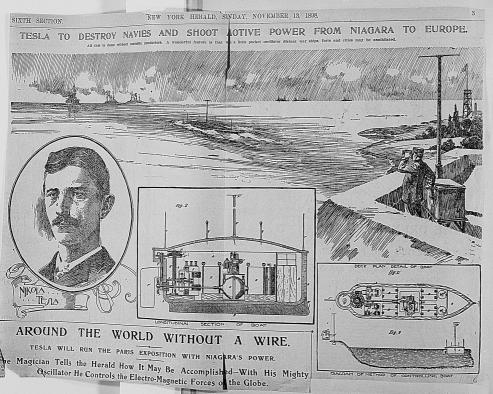
THERE 13 A MEVIL.

I. S. W. Gugdle, haste of the good by the comb livered M. F. Chinek, before a few from the spikes of the comb livered M. F. Chinek, before a few from the spikes of the comb livered M. F. Chinek, before a few from the spike of the comb livered M. F. Chinek, before a few from the comb livered M. F. Chinek, before a few from the comb livered M. F. Chinek, before a few from the comb livered at certainty. I hadd that a few from the comb livered at certainty. I hadd that a few from the comb livered at certainty. I hadd that a few from the comb livered at the comb livered at certainty in the comb livered at certainty. I hadd that a few from the comb livered at certainty is the comb livered at certainty in the comb livered at the limits at the limits and the limits at the limits and the limits and the limits at the

blast farances and steel mills, cannot com-prete in the Elastern markets with the va-grelies of Ellieson in supplying chierp coxi-material to the Bessenz, process size in Ell, af-lieson blast it that Ellison, whose gentles-and a 1 has found in bearry Jerrey cores of dull supeless nock, a mine of wealth and a treas-ury of Infinite value to the world's indus-tivities, had been forced to the commercial during with the contraction of the commercial during visit by the stress of the combined millison, and

Applied Mechanics at Edison, that is down I can greatly increase my. When No. J., Pushes Rockefeller's power Westward.

Power Westward.

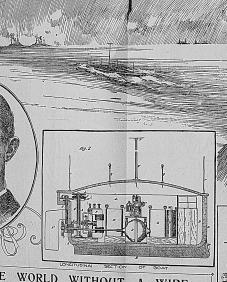




NEW YORK HERALD, STYDAY, NOVEMBER 13, 1898.

DESTROY NAVIES AND SHOOT

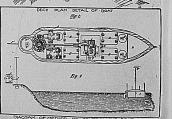
AOTIVE POWER FROM NIAGARA TO EUROPE.



# THE WORLD WITHOUT A WIRE.

RUN THE PARIS EXPOSITION WITH NIAGARA'S POWER.

he Herald How It May Be Accomplished-With His Mighty e Controls the Electro-Magnetic Forces of the Globe.





New York Gas and Electric Concern Expects to Absorb Block Light and Power Company.

BOUGHT BY W. F. SHEEHAN.

It Is a Little Plant, and Generates Its Power in the Grand Hotel Basement.

HAS PERPETUAL FRANCHISE.

Developments in the organization of the big New York das and Electric Light, Heat and Power Company yeaterlay led to the discovery that this giant (125,000,000) corpora-tion will probably absorb the charter of the Block Electric Light and Power Company, a Heek Electric Light and Power Company, a small concern which has an extremely val-uable charter, although its capital stock and honds are only \$200,000 and it operates a very diminuity plant in the theatrical district. Under the new charter of the city it is im-Under the new charter of the city it is im-possible to get a new franchise for a term of more than twenty-fluo years, at the end of which period the property of the company would have to be reappraised and perhaps sold to the highest bidder, unless the former owners were willing to put up a good round This is regarded as a serious obstacle to the organization of new companies in this city, and such obstructive legislation is said to have been largely prompted by the influence of the older corporations, whose control of the streets has been up to the present undisturbed.

the sirecas has been up to the present unustured.

Occupies MARD GROUND.

The charter of the Block Light and Power Company was the Bucker in General Corporation law, and the Bucker in General Corporation law, and the Bucker of the Board of Addermen. The peculiar name enforcement cancels to ship through easily, because the state of the Bucker of the B

Section 2. The control of the country and the PLANS SECRET.

On Saturday it was generally agreed in Wall Street that there must be something yet untold. The wise ones could not figure out that the Whitney syndicate would buy out that the Waltung syncholox swellburg had the gas companies in the city. They may be suffered to the same that the same that

cone of political come brough the indi-cate of political come brough the political come of a celt-mands man than be. Henry use of a celt-mands man than be. Henry use of a celt-mands man than be. Henry use of a celt-fortime without, political aid. After he for the political come of the political indicates to the phase behavior political indicates to the phase behavior of the phase according to the phase of the phase of the phase according to the phase of the phase of the phase to the phase of the phase of the phase of the phase phase of the phase of the phase of the phase of the phase phase of the phase of the phase of the phase of the phase phase of the p

### WHITNEY MAY CONTROL GAS

His Syndicate Likely to Extend Its Field Soon.

HOW THE DEAL CAN BE WORKED

Traction Genius Believed to Be Working with His Brother, Henry M. Whitney, of Boston.

NY Press SAC 12. IF GY
William C. Whitney and his syndicate
may have a bigger thing in the company incorporated some time ago than is generally
understood. The name of the corporation for which articles were flied in Albany some weeks ago is the New York Gas and Electric Light, Heat and Power Company. The electrical part of the syndicate's scheme has been fairly well explained. scheme has been fairly well explained.

The Press of yearchards told that the syndicate controls the Manhattan conducts of the state of

the price.
Although the electrical end has been prasonted, nothing has been told about that part of the mosopoly's title pertaining to gas. Why was the word 'gas' incorporated in the company's title, and right at the beginning? That has puxtled Wall Street men, but there are several things that may exclaim to the property of the pro

explain it. PLANS SECRET.

the use of Femorytenia cell."

The Deep of Chryster of the Chr

There is little to prevent the Rockefeller interests combining with the Whitings interests. It. It. Rogers is a Rockefeller advance and a close parting; of Henry 24. Whitings. The combination could easily be effected.

All this shows that there is just as vast All this shows that there is just as vast possibilities into gaze and of the New York Gas and Electric Light, Heat and Power Company as in the electrical part of the seltens, and far-sching financiers also believe that there is still a think show the hash there is still a think show the Whitney bow-the traction countril. With Whitney bowships the conducts for underground trolley those rounds he does not already our count of the product o

3384

companied to state a band seat, while will be compared to the companied to the william C. Willi

Whitesp proposes to do. MVIME.

No one yet understands the sexts of the project. What is known as their 2ft. Whitespeech with the project. What is known as their 2ft. Whitespeech with the project which is a project with the pro

GAS FOR M CENTRE

John D. Crimmins is the authority for the

ready our could be gathered into the fold private without most difficulty. It is remained the Schrift was a support of the control of the con

statement that William C. Whitner has ac-mired the controlling interest in the Houst-Morris Electic Licht Commons, the Dillom Morris Electic Licht Commons, and the Dillom Land Electic Licht Commons, and the Emule-City Subway Common. Mr. Orimnina made in attacence to pridar, and research libra-iant and the Commons of the Common and experience of the Common and the Common experience of the Common and the Common phants in this city, to form a common for the monopoly of the electric lights and prover phants in this city, to form a common for the common common and the common and the common common and the common common and the common common common common common common common phants in this city, to form a common for the common common common common common common common phants in this city, to form a common for the common common common common common common common phants in this city, to form a common for the common common common common common common common common phants in this city, to form a common common common common phants in this city, to form a common common common common common phants in this city, to form a common common common common phants in this city, to form a common common common common phants in this city, to form a common common

WHITNEY GETS SUBWAYS.

DEFELOPMENT OF THE NEW BIG SAME

PEFFLORMENT OF THE NEW HIGH
MY Sun
Deut to Controls All the High Tention Conduits,
Getting Them Through the New York
Telephone Company, and Is Reaching
Out for Three Electric Light Companies.

makes the side site, to form a common for the supercone of unputries electric licks and owner properties of the supercone of unputries electric licks and owner properties. This is belommed counted somewhite of a form; and the supercone of the s

3385

ELECTRIC LIGHT TRUST FORMING

Plans for Pooling All Greater New York Properties Reported To /899 Have Been Made.

GRÉAT COMPANIES TO UNITE. Combination, It Is Expected, Will Be

Completed About the Middle Heral of February, Jan 20 BIG GOLD STREET PLANT.

According to reports, which I could only partly verify, arrangements have been made by all the men and corporations interested in electric lighting in Greater New York for a pooling of all their interests, and the forma-

pooling of all their interests, and the forma-tion of a hig electric lighting Trust about the All who were said to be interested in the enterprise were very secretive, but it was said

All who were and to be interested in the Man All who were and to be interested in the Man All who were all the present plant of the "Peast would be in Bresilyn." This plant, it was said, had been the resident and the state of Croker, former Mayor Hugh J. Grant and former Lieutenant Governor William F. Shee-

Croker, former Mayor Bings. A Great, and former Lieutenium P. direct Amount them interested in the Ring. Comp. The Comp. of the Comp. o

3386.

Inventor Makes Marvellous Progress in Transmitting Electrical Energy Without the Use of Wires.

CONTROLS DEADLY CURRENT Eight Million Volts of the Fluid Handled with Safety by Means

Herald of Oscillator, Wich 30

SPARK AROUND THE GLOBE.

Nikola Terla has further advanced ble sa-traordinary experiments in transmitting elec-trical energy for commorted jurposes with-electrical energy for commorted jurposes with-ories. I called on him at the Waldorf-Astro o this:--The inventor can handle currentsup to eight

The invitator can handle currents up to significant of voice, produced by the perfected say point at which are represented by the perfect say point at which arrangements have been say point at which arrangements have been made to receive it, and this can be accommended to the perfect of the

he styr, that hundleap has been done away.

MANTAR SHOWN'S I FINTONDAPIS.

Referring to photographs, the current saw.

"In one illustration the leventor reselves
the electrical waves from a distance and decould which he holds in his fauch, preserving
himself against indury by mointaining a fixed
could which he holds in his fauch, preserving
himself against indury by mointaining a fixed
could which he holds in his fauch, preserving
himself against indury hy mointaining a fixed
graph above an ossitiant receiving in his
graph abo tor, which pars through his body and make a mutal bar glow in his hands, also lighting a vacuum tube on the ceiling."
"To the scientific experts who are familiar,

whereas the de of the ceiling."

In these past department with a ceiling and the larger and starters with the ceiling and the larger and the ceiling and the larger and larger and

LIQUID AIR ENPERIMENTS

The second of the se

Since 16 from the top and the boiling water was

In Stearly 46 from the top and the boiling water was

In Stearly 46 from the top and the 17-13 part.

In Stearly 46 from the top and the 17-13 part.

Ingress below error. It is suggested of the 18-14 part.

Ingress below error. It is suggested to the 18-14 part.

Ingress below error. It is suggested to the 18-14 part.

Ingress below error. It is suggested to the 18-14 part.

Ingress below error. It is suggested to the 18-14 part.

Ingress below error. It is suggested to the 18-14 part.

Ingress below error. It is suggested to the 18-14 part.

Ingress below error. It is suggested to the 18-14 part.

Ingress below error. In the 18-14 part.

Ingress below error.

In the 18-14 part.

In the 18-14 pa

3388.

Chicago Electric Correlldation. [Special Despatch to The Evening Post.] Cincago, September & -- A conference is being held here between the Western roads and Gulf lines, the result of which may prevent the advance in grain rates, President Samuel Insuli of the Chicago Edison Company leaves for New York to-day. It is expected that the deal with the Chicago Union Traction Company will be closed with the New Yorkers. The new company, if the negotiations are carried to a successful conclusion, will have a capital of \$20,000,000 of atock and \$25,000,000 of bouds.

Coc. pat Sept. 8 1899

Which of the Content was a sharpened to making the content of the

3389 USES OF LIQUID AIR.

WHAT MR. TRIPLER CLAIMS FOR THE SUBSTANCE.

302 Por MCh 18 1079

Promybree Gallons the Experimental-

ways and Ships-What It May Do for Aerial Navigation-To Supersede Ice-Its Curative Properties.

The liquefaction of air is one of the solentific noblevements of the last quarter-century. In the first successful experiments culy a few drops of liquid air were obtained, but six or seven years ago the British scientist Prof. James Dewer demonstrated

dence that the commercial and scientific applications of liquid air are so numerous and so important that it must effect no small revolution in modern life.

"It is a fact of science," said Mr. Tripler, "that air liquefles at a temperature of 312 degrees below zero. The problem has been how to obtain, and subject air to, that degree of cold. I have discovered that air -compressed air-cnn be so used as to pro-duce that degree of cold, and, consequently, to liquety other air: and I have invented a machine by which the liquid product can be made in great quantities at a low cost "

Liquid air is a clear and fivent substance, which, upon exposure, evaporates rapidly in a heavy mist. It is so intensely cold that the hand held over it is speedily chilled. If the hand is plunged into it, the sensation is that of burning, and unless it is immediately withdrawn the skin is blistered and seared. When the hand is removed, it becomes almost instantaneously dry, for the liquid which had adhered immediately ga-

mediately begins under the influence of the one pound of pressure. He asserts, more-over, that liquid air can be applied as a suballities for steem to any sense, with many sense as a substantially so further though that the displacement of the billies for the same in any
placement of the billies of the same in and
placement of the billies of the same in any
placement of the billies of the same in any
placement of the billies of the same in any
placement of the billies of the same in any
placement of the billies of the same in any
placement o

it, and the most gratifying results have been obtained. It is too early to say just what its value is. I do know that its application to cancer has stopped the spread of the discase, and in one case the wound has con-tracted to a very small one. In another case, after a number of applications to a cancer on the breast of a woman, it fell out into the operator's hand. A number of cases ist Says He Makes Ten-Its Use as an of cancer have been under treatment, and in Explosive-Cheap Power for Ratirendered incurable by the free but vain ap-plication of the knife, it has arrested the rencerous growth. It has, besides, a marked

THE WAY WAS A SECOND

effect in removing the pain accompanying the disease. A patient suffering from cancer of the ness said that the shooting pains which had previously afflicted him disappeared entirely after the first application of the air. It is quite possible that it may have some special value as a local anneshe-tic. It appears certain that gangrene can be scientist Prof. James Dewn demonstrated that it could be produced in quantity. The foresteen does not not be reported to it washing. The servers, however, was enormous—a plat oming about \$500. Now comes Charles B. Z. in most a hybridist or a surgeon, left its produced of the city, who is the curative properties of liquid articles and reproduced for the city, who could be considered for the city, who could be considered for the city, who is the curative properties of liquid articles are produced grades of the considered for the city of the considered for the city of the city o declares that he mas produced gallons of li-quid air at a coat of shout twenty cents a gallon. He further claims that flould air ful study by two physicians whose names I can be used to make liquid air in larger quantities—that he has actually obtained ten harmonic for the numerous inquiries addressed to me will here the second of the numerous inquiries addressed to me will herefore go to them. They are Dr. J. W. actions from three.

The three results of the control of the contr the lungs and destroy the bacilli of tuber-culcule. Indeed, the physicians have suc-ceded in applying it to parts of the body where I thought it could not be applied, and, therefore, it seems a distinct probability that means will be devised by which disease germs, wherever they may be in the human body, can be reached and killed.

"As for its use for refrigorating purposes, that is as wide as the need of refrigoration is. Ice can be made with it; it can take the place of ice in refrigerators; it will be useful in packing-houses, in markets, in hospitals, and in hotels and houses in summer. "As a substance capable of being made into an explosive of tremendous power, you have the testimony of a greater expert on that subject than I am."

He referred to Hudson Maxim, the brother of Hiram Maxim, who had been present in the laboratory a few days before, drawn by reports which he had heard of the possibilities of liquid air as an explosive. Mr. Maxim had been told that a small quantity there in bright bonds that drop heavily to the of cotton waste saturated with liquid air had Soc. Hould air, as power, Mr. Tripler claims that it has about one hundred times the expansion in place at large steps; as pro-that it has about one hundred times the expansion for place at tection from the possible effects of the expansion for places, and that by means or a long fuss the places, and that by means or a long fuss the present of the p mediately begins under the influence of the prevailing temperature, and that every additional degree of heat applied yields twenty and two great holes which had been blown pounds of pressure. Steam pressure is not through the outer one. With Maxim deobtained until water has been heated to a temperature of 212 degrees Fahrenbeit, and 
cach additional degree of heat products only whether the ends of the pipes had been 
whether the ends of the pipes had closed. The merest palm-full of waste was exhibited, and the ends of both pipes, he was

3390

DISPUTES MARCONI'S CLAIM. Prof. Dolbear Says He Is the Discoverer of Wireless Telegraphy and

piled for a patent he made the following deciarsition: deciarsition: deciarsition: deciarsition: deciarsition: deciarsition: deciarsition: deciarsition deciarsit seen with merchan in June 2018 and the seen of the see

An abstract of the first of the National State Institute, National Annual State Institute, National State Institute, Natio

gas was one of the next of these invisible and confertible scrident. He almost intengible substances to be brought to a band first, and this soon afterward was actually freeze into a subvery mow, which would be whickly fee. rotain this form for a long time in the open air. With this contents only one ways teterate the properties of the season o With this earhonic and snow yours interest when we will as missions of dispers of each part is a minimum of the minimum of t

the expected sortenet retrotect into a soom, now there, a more rapidly enverywhere rows prederes, a more rapidly enverywhere rows prederes, a more rapidly enverywhere rows prederes, and this reduced the towerstrees of the 
produced and the first produced in the 
produced and the first produced in 
produced and belf for each gregoriest 
could be produced and belf for each gregoriest 
could be produced and belf for each gregoriest 
gregoriest and belf for each gregoriest 
gregoriest produced and produced and 
gregoriest 
gre

st. our feet with.

It is not too with.

It is explicitly the of the temperature of any life or the other temperature of the

present of the gas of the state of the present of the gas of the state of the present of the gas of the state drop, but it was in auch uneil particlet and so wanescent that no actual cramination was made of it.

Mr. Triplet, as has been said, is formishing considerable quantities of the liquid air to Co-tain and the said of the liquid air to Co-tain and the said of the liquid air to Co-tain and the said of the liquid air to department said; and Tyref, flood of the play sies department and the liquid air to the said of the with it which, he believe, will prove of great laterest to science.

Chicago Electric Contolidation. [Special Despatch to The Evening Post.] CHICAGO, September 8.-A conference in being held here between the Western roads and Gulf lines, the result of which may provent the advance in grain rates. President Samuel Insult of the Chicago Edison Company leaves for New York to-day. It is expected that the deal with the Chicago Union Traction Company will be closed with the New Yorkers. The new company, if the negotiations are carried to a successful conclusion, will have a capital of \$20,000,000 of

stock and \$25,000,000 of bouds. Coc. pot S. p. 8 1899

For that Mr. Tripler provides by he for the provided provided to the first of the provided provided provided to the first of the provided substitute for steam, operated the engine quaintance."

Mr. Triple

is be had used the steam-power.
"I find in this matter," he said to-day, "Make I have been exercised management of the second of th quantity of liquid air, substituted for steam power, I can make, and have made, larger quantities of liquid air. I use over and over again the liquid air employed in the making. It seems simple enough to me, and the principle is a simple that it ought to have been grauped by any analysis.

Prof. W. G. Parkham

As fact their contentions are all aside from Scientife American. "In the intermediate many for the properties, and do not more as the properties, and do not comprehed at all what I am about."

"Thes, whatever the modes operand may be you do desired to compresses, as cooler, and a figure of the properties of the confeasy." of any given quantity of liquid air you can make a larger quantity?"

"I positively and absolutely make that

claim."
"You claim also that by the use of three sallons of liquid air you have produced ten?"
"I have done that very thing," replied Mr. Tripler with emphasis.
"Does "".

The services are probably protected to 17 per large transport from the control of the per large transport from the per large tra

at discussion would be suggest, and was its varily greater potentially, it must be client significant from the manufacture with an explosive client process denom, if it can be made chearly enough.

At a succession of the committed of the commit theaply enough.

For that Mr. Tripler provides by his tion arose in his mind, whether the volatility

Mr. Tripler said that he had not vet granted rights under his patents except for "a few little things." He had received than now, for his steam-plant was small, and was operated without special effort a

Prof. W. C. Peckham of Adelphi Insti-tute, Brioklyn, from whose pen an article on liquid air will appear in the April Century, at once, but, to my surprise, it has not; what my critics say appears plausible, but has also written on the subject in the Scientific American. In the latter journal fact their contentions are all aside from be has given this description of the plan

has has aftere that contribution of use pro-tead of the contribution of the contribut

MR. EDISON IS SATISFIED HE PAYORS UNION WITH THE THOMSON-HOUSTON COMPANY. N Y, Times IN PACT, HE WAS THE FIRST TO SUGGEST

マレバディコマンしてかん

IT-THE RETURNS FROM HIS SHARES WILL BE GREATER, HE THINKS, AFTER THE CONSOLIDATION,

AFTER THE CONSOLIDATION,
Mr. Thomas A. Milmon, the Investment all last
marks to a Thirty reporter that the proposed concidulation of the Oblasse General Bischrife Cestmarks to a Thirty reporter that the proposed conplanty with the Thomason-Houston Company with the Consolidation of the Conpany was the Consolidation of the Conpany was the Consolidation of the Conlater than any marks that the Contraction of the Contraction of the Conmarks that t The stories in which some of the news

The street is which seem of the same proper has comed in the same of fractional proper has considered and some of fractional considered and the same of fractional considered and the same of the same

siters, and nor maintaining the siters, and the siters working capital was model to run is large working capital was model to run be basiness, Mr. Edison said, because of the mone contracts made and the length of time fore payments were made. He etce the consection of electric railrupa as on illustration that fact.

bond analyzardezieda ja the constituentes, bereit in with a straight production ja the constituent of the straight was straight and these wavelet in with the straight was produced in the straight was provided in the str



Low volts of the same manufacture have always been known to be superior to highvolt lamps. Prominent makers guarantee 13 per cent, better results from low-volt than from 100 to 126 volts. The reason is, that the former are "treated" lamps, or "flashed" at a higher temperature, and have a greater percentage of denser, pure deposited carbon. Bryan-March New Doubles Filament Lamps have two 50volt filaments in series. In consequence, under specification, their guarantees of candle area are higher than any competitor, and owing to their durability, 3.1 watt lamps can often be used where 3.5 watts were formerly used.

The only independent lamp used by large Central Stations.

Michigan Electric Co. DETROIT, MICH.

3394

MR. EDISON MAKES A DENIAL. HE SAYS HE HAS NO GRIEVANCE AND PAYORS

There was much talk resterday over the reports of There wis middle that sentence over the defents of the fettless in the necessitations over the consolitation to the fettless in the necessitations over the consolitation to the fettless in the necessitation of the fettless in the fettless breached he was invited to meet the effects of the two companies, and consulted in reference to the matter. It was clearly shown that, as at present, the

control. It was clearly above that is a layered, the vice community was residently cutting each others. The controlless was residently cutting on the controlless of resigning from the board or of withdrawing in any way.

Mr. Edisco said that he had never heard of the alleged
strained relations between Henry Villarit and J. Pilorpont Morgan, and he did not believe that there was you horgan, and no tax nos bonder that there was a particle of truth in the story that was in circulation to that effect.

Mr. Edison was asked whether he felt aggreeved at ]

Mr. Dities was ashed whether he fell supreleved at the management of the company and what he had to the management of the company and what he had to the replicit that this size was wholly unirus. When the Edition General Directic Company was organized he had the control of a large number of sloop that the control of the company was organized he had the control of stock he still holds and considers it worth par.

The basis of consolidation of the Edison General
EleCide Company with the Thomson-Houston Company
is that Mr. Edison will hold about 15 per cent of the he that Mr. Edison will held about 18 per cent of the clock of the new company, and with this arrangement for expresses himself as perfectly satisfied. Mr. Edisons said that Mr. Insulf was the right-hand man in the state and that the retirement of Mr. Insulf roun the company was no reflection on him. He was the Edison's personal representative and was more



Tischer (quebrueures Chicago) (

5096

ASSURING FAILTON MAIN STATES.

Travestict Sun Tenne and Rade 40 Per
March 1988 The State College of Pe experiment was made at Lord Brayo's country these near Market (Barbotouch, in the pre-side of several persons, and demonstrated, experimentally as a series of the several could be statted from the ground several stay us in the air for a time. A description of the apparatus and of the action the ground in the apparatus and of the action the given in Expurervice.

The state of the s

BHY ECTOV POST

3897 \$3877 | STATE OF STAT

heat is shown by the fact that in a closed oven one bequests will remain in a glowing state for twenty-four hears, while in an open grate, though burning more quickip, it remains alight for a longer time-than any coal, and giving a good red heat. The cost of working is comparatively light, only a (see hands being required to attend to the machinery.

3395

### LAMPS! LAMPS!! LAMPS!!!

The Best Incandescent Lamp in the World is the "COLONIAL."

MADE BY



OF YOUNGSTOWN, OHIO, U. S. A.

## Incandescent Lamps.

Made with anchored filaments which allow the Lamps to be burned in any position and where there is vibration, without drooping of filaments.

> Sawyer-Man Electric Co., .... Allegheny, Pa.



# Consolidăted Gas Co.

OF NEW YORK. GENERAL OFFICES, 4 IRVING PLACE.

aug 1899.

The price of Gas from May 1 and until further notice will be at the rate of

### 65c. Per Thousand Cubic Feet.

187, 189 Hoster St., corner Elizabeth, 4 Irving Place, corner 18th St. 360 4th Av., corner 26th St. 1,847 Broadway, corner 46th St 2,084 3d Av., corner 114th St. . 217 West 128th St., between 7th and 8th Avs. O. F. ZOLLIKOFFER, Secretary.

New Amsterdam Gas Company, 1899

General Office, 340 THIRD AVENUE. The price of Gas from May I until further

notice will be at the rate of

Application may be made at any of the following offices of the Company:-

840 THIRD IAV., 138 WEST 42D ST.

COR. 3D AV. & 93D ST., 189 WEST 125TH ST. FORD HUNTINGTON, Sec-

WARNING TO CAMPHOR TRADE.

Japan's Monoparty by the Formosa

Product is Raising Prices.

NYTHE TERM THE LEAGE Gibbs. E. J. J.

The listed Consular report on the trade of North Formous states that North Fermons attates that the camphor-trade, that is to say the manufacture of camphor, for some time past in the hands of German merchants only, has ceased to be, of interest to any but Chinese and Japanese, the latter having in every way more facilities that the same past of the same past of the Although the same past of the same past of the past o

# **EDISON WILL NOT**

His Latest Invention Is to Be a Gift to the Scientific Soumat Fraternity, West 28

Right to Manufacture the Marvellous Fluoroscope Given to a Former Employe.

rgeons May Procure the New "Spectacle" for Use in Their Practice at Moderate Cost.

STRONGER TUBE IS NOW DESIRED. Witard's Energies Are! Turned Toward

Developing a Tube Strong Enough to Resist the Force of Thirty Powerful Lamps. The experiments with Roenigen rays are

still in their infency, according to Thomas A. Edison, who, after weeks of work on what they are, and what can and cannot be done with their assistance.

Edison's intest gift to science, the finorescope, will never make its inventor a penny. The great genius announced restorday that he had not patented it, and did not intend

be hind not patentied it, abut use for increa-to patent it.

"I have given it away," said he pester-day. "It is not a commercial thing. It is releasing, and I wish to see it in general use. I have given the right to make it to a former employe, who is now in business for binnel. Or course, he will make a little money with, it, or I hope he will.

"When I fishth to 30 constrained with "within I fishth to 30 control for the best for the best for the second of the fisht of the fisht

with a pump, and that that the result is a great sleal mass subfactory.
"The fluorescope is, I believe, destined to accomplete, great things, As soon as I can recomplete great things, As soon as I can whole frame will be visible, I shall make a small apparatus and let the medical men-hacy is. I shall met paters it or attempt to control it, I will publish it, and say dealer will be able to make it; induction will mad Take will believe it within the result of a very. This will believe it within the result of every. This will being it within the reach of every-body with may have occasion to use it.

"We are as yet in the infrarey of the "We are as yet in the infrarey of the infrarey of the property of the property of the thin we can, by plenting the oblight the tween the lump and the florencespe, see the flesh at a certific disasser, and that at a-shorter at a certific disasser, and that at a-shorter that we will be allowed to the state of the show. Whether we shall ever be also do differentiate between the through the muscles and the barn? I do not know, but I believe that we will be able to locate tumors by This will bring it within the reach of every

"The Generacyse is able to in in man-inates what the photoeraphic required and host to do. That, of coates, in a improve-neat, When I at themsely with proper-mental part of the properties of the I am principal to the selection of a Mr. Ellion spection early the whole of periodic properties of the properties of Mr. Ellion spection early the whole of periodic properties of preserve, The generates I great assume of comes. The mentions and to summification for comes. This properties I great assume of comes. The character is at the lamps, and the jumps because clogged. Mr. Ellies we as I lead to industricated what was the cases

"The fluorescene is able to do it

PRINTED MATTER. U. S. G. S. No. 5. 3 924

Department of the Interior, OFFICIAL BUSINESS for SHHirte De

- Chas. Batchelon 33 74, 25 4 81. REGISTERED



NOT IN THE TRUST.

# MONARCH LAMPS

The best lamp that modern machinery and mechanical skill can produce.

### LONG LIFE, HIGH EFFICIENCY, SUSTAINED CANDLE POWER.

Voltage or Candle Power Shipped Promptly from Stock

#### THE TRUSTS ARE POWERFUL

Trust.

Are you looking to your own interests, or are you going to help strengthen the power of a mighty Trust?

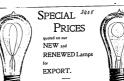
We make a lamp which for life, efficiency and economy can not be excelled.

ANTEE. Write us.

MIDNIGHT GLOW.

McLaren & Goodchild, 24 Boodlaot St., Newark, N. J.



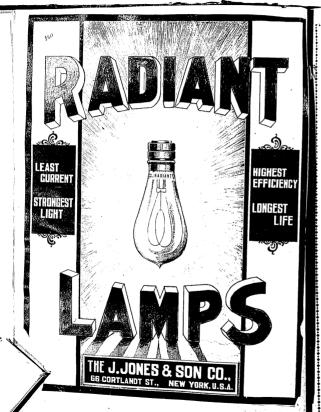


Correspondence Solicited. LYNN INCANDESCENT LAMP CO., LYNN, MASS AUTOMOBILE IN THE CLOUDS.

President Jordan, of Stanford Univer-President Jordan, of Stanford University, Prives One to the Top of the Cold. Mount Hamilton. Object Sax Francisco, Cal. Friday-Freident David Start Jordan, of Stanford University, went up above the clouds yentrody in an automobile. He travelled from Sax See to

Wall Street understands that serious trouble has cropped up between the pro-moting interests of the Kern Incandescent

meh 2 1900





Established 1889.

### Columbia Lamps

Unequaled in Quality.

N UNBROKEN RE-CORD of success for ten years. Our guarantees are specific.

Absolute uniformity in initial readings for candle power voltage and efficiency.

Highest maintenance of candle power throughout life. We

invite the most rigid tests for proof of our claims. We challenge comparison with any other make of lamp in the market.

Special attention given to export trade.

The Columbia

Incandescent Lamp Co. MAIN OFFICE AND FACTORY,

1910-12-14 Olive St., St. Louis, Mo



36 Union Square. May 1, 1899.

Herenfter and until further notice the price of gas to all ustomers of this company will be at the note of

65c. 1899 PerThousand CubicFeet

W. C. BESSON. Secretary and Trensurer.

34/4 A Two-Speed Genr is made by enlarging the rear-wheel hub and inserting four bevel-gears. When the machine is to be "geared down," the bolt, at the left of cut, is allowed to drop into a notch which locks one of the gears. This



the driving-force acts, and with the result that it takes two revolutions of the sprocke wheel to turn the hub once around. The effective driving-power is thus doubled, barring what is lost in the friction of additional moving parts. When the bicycle is running at its normal (high) gear, all parts are turning together

and the friction is the same as on any ordinary wheel. This device is an adaptation of the "box of tricks" that was advertised as a part of the Broncho Hicycle in 1890.

### New Amsterdam Gas Co.

General Office, 840 THIRD AVENUE

252 West 14th Street. BRANCH OFFICES: 138 West 42d Street. Corner 3d Avenue and 98d Street. 139 West 128th Street.

On and after December 1st, 1899, the price charged for Gas by this Company will be restored to the legal rate of

\$1.10 Per Thousand Cubic Feet. and on and after January 1st, 1900, to

\$1.05 Per Thousand Cubic Feet FORD HUNTINGTON, Sec'v.

### NEW AUTOMOBILE AMBULANCE



(Proper Tretterales etc.) AN AUTOMOBILE AMBULANCE.

ANTONOMISM is being utilized for pulse press to the horizontal and Automobilism is being utilized for pulse press to the horizontal and Automobilism is being utilized for pulse press to the solution of the press to the solution of the press to the solution of the press to the pulse of the pulse of the press to the pulse of the p

A New industry has started to take common rock salt that costs, delivered, 60 cents a ton and produces caustic soda, chloride of life, used for paper making and blenching, and chlorate of potash used in the manufacture of explosives, all by electro lysis. The works have 200 tanks, 20 ft. x 3 ft. made of slate and holding 72,000 gallons of brine, which will yield too tons of bleach and 60 tons of 70 per cent, caustic soila weekly. Fach tank is divided into 32 cells, these being provided in alternation with suspended anodes and suspended cathodes. Each tank requires from four to five volts to send 7,000 ampères through it. The chlorine gas skips to the anole, the liquid caustic soda to the cathodes, the latter being heavy is drawn off.

Each of the two dynamos yields a working current of 3,500 ampères, a total of 7,000 ampères, which is sub-divided into ten currents of 700 ampères each. A switch board, by Messrs. C. A. Parsons and Co., provides for the distribution of these currents; upon it are two Weston ammeters for 4,000 ampères each, and a Weston voltmeter, the ten currents being each proeach, and a weston voltmeter, the ten currents being each provided with separate ammeters. From each side of the switchboard five cubbs lead to the decomposing tanks before described. Evaluates the control of the con fold. That of the first importance is cheapness. These products are produced at half the usual cost.

Gold Extracting been introduced which will bear the exami Another gold extraction process has been nation of gold miners and is of interest to all. The apparatus in question was shown in London, and the process is termed a pneumatic analysms.

tion process in which finely pulverized dry ore propelled by a tion process in which finely pulverised try ore propelled by a current of air through a restricted channel encounters numerous pools of mercury.

The appuratuse consisted of the of 3 in plping, coiled into a foar-coil spiral and mounted horizontally; one end of the

tour-con spiral and mounted nonzonanty; one end of the spiral projected into a dust-chamber, the other end served for the attachment to the air machine, in this instance a handpower Root's blower. At the top of the first himb of the first coil the feed-hopper was fixed and communicated with the interior by a pipe continued some way down, and provided at the threat with a balanced swing valve that prevented escape of air, but yielded to any slight pressure from above. To lower ends of the spiral were detachable and had been charged with mercury before the arrival of the visitors, the quantity used being insufficient to entirely obstruct the passage. Me terial representing ore, and consisting of silver sand, to which course and moderately course gold had been added, in the pres-ence of the visitors, was charged in the hopper, the blower was set to work slowly, and soon a cloud of dust would be seen issuing into the dust chamber. After some little time and the expenditure of much work on the blower, the sand had disappeared from the hopper, the blower was stopped, and the lower parts of the coils were detached severally, and examined separately; they contained clean, bright mercury and a not inc siderable proportion of sand. The mercury was subsequently found to contain gold, as might be supposed, the bulk of i being in the first bend. The apparatus used was capable of dealing with five tons of ore in a day of ten hours, and would save from 80 per cent, to all of the gold; and that apparatus of any size and capacity could be constructed; such being the case, there would be a large and useful field open to this appliance wherever dry free-milling ores are encountered. The inspection demonstrated clearly that the apparatus was of admirable simplicity, that it could be very easily worked, that a moderate current of air, stated to be about 1 1/2 1b. per square inch, sufficed to carry away most of the sand, and that much if not all the gold remained; but owing, as is frequently the case on such orcasions, to an absence of the necessary data, it is impossible to judge whether the work done had been effected at the rate of 6 ewt. or five tons in ten hours, whether or not all the gold had been saved, whether it was accompanied or not by a loss of mercury, and whether or not it could deal with differ ent class material successfully. But anyway the apparatus in so simple, and can certainly not be very expensive, so that it should be well worth the while of mining men, requiring an appliance for treating dry free-milling gold ores, to bear this process in mind, July 1896

3422

Thirti-Cultural Illian Bernat Bumbatron Product Suns. April 18-2 A

3421 The well-known European scientist, Professor Lascelles Scott, who is visit-Invisible ing Philadelphia just now for the parpose of critically investigating the dis-

coveries and inventions of Mr. J. W. Krely, has evidently gone a good leaf farther than other inquirers into the properties of the "Roemgen rays." The following letter from him upon the subject appeared in the London Times of March 10, 1896: oject appearen in the London Itan's of March 10, 1896; "Permit me briefly to record in your columns, indisposition

having prevented an earlier announcement, 1. That the flaving prevented an earner announcement, to know the seeingen rays, or, in other words, some other vibrations of such high potential that they are capable of permeating various substances generally termed 'opaque,' are capable of 'refracsubstances generally termed 'opaque,' are capable of 'refrac-tion' under certain conditions. I shall hope to indicate more at length after my return from the United States.

 That rays emanating from various fluorescent substances besides platino-cyanide of barium—c<sub>S</sub>, quinine, stramonium, besines piatmo-cyanine of narium—c.g., quinne, stransonium fluoresceine, calcie sulphide, and that form of the old 'Bologna fluoresceins, calcie sulphide, and that form of the old 'Bologua' or 'Cantos' phosphorus, 'often milited as 'huminous paint,' will pass through this leaves of 'opaque' vulcanite, wood, etc., and having done so will profess, so I call them sometimes, 'vibriographs' of suitable objects if the exponence be long enough

> MECHANICS [June, 1896

"3. These 'invisible' photogenic mys—which I have reasons for believing are not invisible to the eyes of all animals—will even 'print' a photograph from an ordinary film-negative or transpurent positive, provided that sufficient time he allowed for the process. I enclose two little prints from the same film-negative. 'A' printed in bright smalline in 40 seconds, and "B' printed from a vibriograph fluorescent surface through a

thin 'opaque' shret of aluminum in three and a half weeks. "Professor Dewar's aspiration expressed in your columns to-day that we are 'on the dawn of new knowledge about the material (2) medium known as the ether,' will, I trust, be realized at no very distant date "

3423 TO LOCATE SMOKELESS GUNS.

TO LOCATE SMOKELESS GUISS.

Ordanes Officers WILL TWE lives a parameter for being presented in Experiments to be presented in Experiments to be presented in Experiments for being a parameter for the present of the present of the state of the present of t

HOW AUTOMOBILES CARRY THE MAILS IN BERLIN,

The Post Office of Betlin has just put into practical use six of the "Loutpid automobiles, of which the picture below is a representation. A large additional number of these Wagesten, which is a good ground at the works of the Guestlechnic fifty automobile Wagesten, which is a good ground of the control of the works of the Guestlechnic fifty and of Gormany and ceased to be an especiment. Several other large otiles in Gormany will seen adopt the name delitery motion.



WIRELESS TELEGRAPHY NOT NEW. W. J. Clark Says Messages Were Sent Without Wires as Early as 1746.

As the annual meeting of the New York Electrical Society last night, in the Concret Hall of Madison Square Garden, W. J. Clark lestured on "The Possibilities of Wireless Telegraphy and Telephony," and conducted a member of experiences.

and you have a second or substitute of second or substitute or substitute or substitute of substitute or substitut

work. Atthough Macron or the results he in nearly observes credit for the results he in analysed, the nearly observed the second of the interest of the intere - nove 1899

Sir William Creeks, who a year age annonnered the clarerery of a new element to the British Association, has completed his investigations on this subject and receive percentred a full account of his work to the linyal Facility. The new element, which was some unced under the name of Morium, has hern renounce Victorium, and is of a pole brown color, carily soluble in spide. It is lers bende then verte but more so then sera tende thou yttria, but more so than most of the carries of the terdis group. In the tende group, it is che miceal properties it differs from yirls, but generally proposition; to copying a mid-position between that element and tenderm. Its niceal weight is computed at 117, and the phospherescent spectrum of the article shows. axide shows certain lines that have not hitherto been musclated with any other ele-ment. This discovery Blustrates both the refinements and the possibilities of modern selentific research, as it required the man-tery of several branches of science and tery of several branches of selence and spricality designed lastraments of precision. The The almost pure chromet was entoacd in a vacuous built and submitted to molecular bombardment from the megative pole of an induction real just as is stone in the case of an X-ray built. The phosphorecorne thus obtained was an X-ray unto. The phosphorecenre thus obtained us then cannaled and phosphorecenre the obtained us that the cannal photographs of the ultra-visele power, and photographs of the specific power, which is the property of the pro tions were necessary before the element could be obtained in sure torm. Oct / 1899

3426 1899. Sem July 2 1899 4

FURNACE-MADE GRAPHITE NIAGARA'S RESCURED ENERGY USED TO DUPLICATE NATURE'S WORK.

Out of the Inspense Heat Used to Make Carbide of Silicon, Something First Dis-covered in a Hout for Diamond Making, Has Come the Making of Grabite.

Control of ullian American Part Do-lian Chair in Markes of Granata-ta Markes of Caracta-ta Markes of Caracta-na Parasitation and hel returned to named and Parasitation and hel returned to named and possite, in children for editorial and possite, in children for editorial would be a market produce of an ac-tivation of the control of the con-trol of the con-trol of the control of the con-trol of the con-

year in and war on with noutr's OSO our-best in souther of the same process for grantless that the insouther of the same process for grantless that the souther of the same process for a same pro-teated on the same process of the same pro-teated on the same process of the same when grantless will be same process of the same process that put has been been same pro-fessed has been been often or the same formed has just been breaken at these. This to the new manufacturing data when the same process of the same pro-fessed has been been deep to same a same formed has just been reduced to the same formed has just been reduced to the same formed has been been been been to the same formed has been been been been been as to the formed has been been been been been to the total same process of the same tension of the same property of the same water product from the relaxation and could be same water product from the relaxation and could be same water product from the relaxation of the same product from the relaxation and the same product from the same product from the same same product from the same product from the same from the same product from the same product from the same product from the same from the same product from the same product from the same product from the same from the same product from the same from the same product from the same product from the same from the same product from the same product from the same from the same product from the same product from the same from the same product from the same product from the same from the same product from the same product from the s

The state of the s

The second secon

3/27

PHONOGRAPHIC TREEFHONES.

A Dana Invents a Menus of Leaving a
Mesuage at the End of a Wire.

Security of the security of th

and the second second second second

8128

HE MADE THE PURST PHONOGRAPH. John Kruesl, Who Was Buried on Peb. 25, Was One of Ellion's Best Assistants.

school, Francisco, Har West Bernette on Prob. in West Bernette on Prob. in the Control of the Control of the Management of Prob. in the Control of the State of the Control of the State of the Control of the Control of the State of the Control of

A few days later he called Kruesi to him, and.

A few days later hecalled Kruesi to him, and, putting late his hands a rough sketch of the phonograph, exclained what the thing was to do, and told him to make it. It was a roll machine, the roll covered with tinfoll to take the prend.

the record.

Krucal made the machine and brought it to Mr. Edison. Edison set it going and spoke into it:

Mary had a little lamb.
Its flerce may white as snow,
And comprises that Mary went
The lamb was saye to go.

"A consequent was the real of the consequence of th

2425

# Believes in Cod, but Says it is an Insult to a Says it is an Insult to Says it



by and numbers. Are you have been a proper to the collain reverse to me to be made speed as me. Many are stock in the collain reverse to me to be made speed as me to Many are stock in the collain of the stock of the collain of the collain of the collain reverse to the collain of the collain

#### Chemistry Affords Proof.

By William T. McClement.

All indications be described the south to the state of th

#### Edison's Lame Conclusion.

T is a pity for so hopeful a beginning Mr. Edison makes in his interview to has in so "inme and impotent a conclusion." He says:—"It is an insult to the wisdom

#### Prayer Beyond Science.

By John M. Coulter

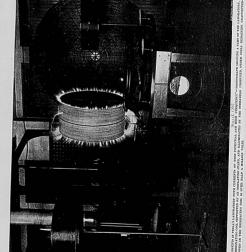
#### Infinite in All Nature.

By A. V. E. Young.

#### 3483

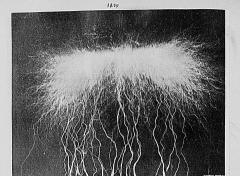
The Niagara Power Plant.

The Magara Power Plant.
The first practical test of the hydraulic works at Niagara Falls, which have been under construction for three years past, was made January 25, when the machinery at the Niagara Falls Paper Allils was put in motion. These mills have contracted with the power company for 3,300 h. p., which is to be increased to 6,600 h. p. later. The general power station, where creased to 6,600 h. p. later. The general power station, where it is expected to begin with dynamos of 5,000 h. p. from which power will be transmitted to purchasers, will be ready by June next. The station has been designed in such a way as to permit of future extension to any amount required. There has been a good deal of criticism here on the designs of the power plant, which were uninly the work of Swiss engineers, and its workings will be watched closely and with much and its workings will be watched closely and with much interest. It is stated that the contracts with the paper mills provides for a rental of \$8 per horse power yearly, which is certainly a moderate rate.—[Engineering and Mining



14335

3432



6. II.—PHODOGRAPH OF AN ACTIVE TERMINAL OF AN DIFFICULT OF THE PROPERTY OF TRANSMITTING ELECTRICAL EXECUTO GREAT RESTANCES WITHOUT WIRES—WHITH OF ILLEMNATED SPACE IS 18 FEET—THE PRESSURE ON THE TRAINAL IS NOT THE THAT THE TOTAL THAT THE PRESSURE OF THE PRESSURE ON THE



Fig. 6.—EXPERIMENT ILLUSTRATING THE 66. 6.—EXPERIDUALY BLESSHAVING THE ACTION OF A SYNCHRONIZED CHICCIT EXERGIZED BY WAVES THAN SMITTED FROM A DISTANT OSCILLATOR — THE EXPERT



. B.—" SOME KUPERIMENTS IN TEMALS LANGUAGE WITH CURRENTS OF HIGH POTENTIAL AND BRIGH PROPRIESEY—THE OFFRATOR'S BODY, IN THE EXPERIMENTS OF HIGH POTENTIAL AND BRIGH POTENTIAL OF PARKS OF A COLL REPROSENCE TO THE WATER OF THE WA

#### 3637 DEPOSITING COPPER WITH HIGH CURRENT

CURRENTY

A very suggestive exhibit, and one full of promise, was that of Mr. I. W. Swain, shown at the recent Dayal Society, the control of the property of the control of the property of the control o DENSITY.

### 323 Ya

Annumental beausers and exchange exchanges are supported by the Chander of the Bankers of of the Ba

THE ELECTRICAL ENGINEER



THE CHAMBER OF DELEGATES AT THE ELECTRICAL CONGRESS,

3239

THOMAS A. EDISON, PRESIDENT. SAMUEL INSULL. W s prppy Vice-Passoner.

THOMAS BUTLER,

CHARLES BATCHELOR.

NEW YORK CONCENTRATING WORKS,

NEW YORK

### BURNED-OUT INCANDESCENT

SEND US YOUR BURNED-OUT LAMPS. WE REPLACE THE FILAMENTS. THIS IS OUR SPECIALTY.

SEND FOR CIRCULARS.

#### DAVIS ELEC. WORKS,

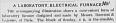
**LAMPS** 

RENEWED

REDUCED RATES TO CENTRAL STA-TIONS THAT SEND US OVER 500 LAMPS PER MONTH. 1803 WRITE FOR PRICES.

SPRINGFIELD, MASS.

New York Office: BUSHNELL & CO., 35 Broadway,



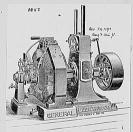


A LABORATORY ELECTRICAL FURNACE.

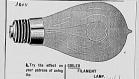
which can be laken out at will. The carbons, C.C. can be moved by the errow, V.c., or by being pushed out after shekers and the control of the control of the carbon of the carbon to matched, as the cube are covered in by mice, held by the chaps 1. fastened to the metal framework 3.19. This farmace will work with a current of 12 volts and 12 mappers. According to the Glade Crief, from whose columns the particulars and illustration were taken the farmace works admirably.

3843

### the X Rays Are Turned Into Pure White Light.



DIRECT COUPLED GENERATOR AND ENGINE.



BUCKEYE" HIGH GRADE, HAS NO EQUAL.

THE BUCKEYE ELECTRIC CO., - Cleveland, O. CHIGAGO: 437 The Rookery. NEW YORK: 49 Doy Street.



WHALEHACKS-LIGHT AND LADEN



WHALEBACK STEAMER "PILLSBURY."

3447

#### SAILING THROUGH THE AIR, | Property of the Control of the Control

3648 Lilienthal Describes the Principle of His Latest Invention in Flying Machines. 1894

Herael - June 3
AROHED WINGS THE SECRET OF FLIGHT.

Soared for Nearly Three Hundred Yards with the Apparatus He Has Constructed.

I TAMES CORDON RECORDED.

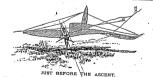
BREATY, May 25; 1884.

IIB caperforce of the ceitury and more which has clapsed since the invention of "Montgot-for has faught us that the bulleon he of pencifical service only whose confined. The whitms of the winds are too control to winds are too control to winds are too control to the service of the pencific and polythic precedure, and notythis.

incurrently lated at processing and section of the support of the







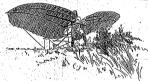
oportionities of presenting the femalities and the state of the state





convinced that it was the gentle parabolic unree of the wing which combier a hird to sustain itself without approach effect in the size and even to son, without a motion of the wings, against the wing. Against the wings, like the silar, and even to son, without a motion of the wings, against the wings. His the silar, teas, or acc guil or stori; and this may be regarded as the must important outcome of Herr Limitable investigations.

Herr Limitable investigations.



THE WINGS SPREAD FOR FLYING.

3451

### THOSE YOGI

MIRACLES OF INDIA. Que 91 - 1994 Thomas Stevens Declares That the

True Yogi Merely Reverses Human Nature.

#### PHYSICAL PHENOMENA.

Wonders Attributed to the Hermits Because of Their Supersensitiveness and Secreey.

Interest and Exercise.

He was a second to the control of the cont

Great Scheme of the Metropolitan Traction Company for Street Car Transit.

#### VARIOUS LINES PROJECTED.

\_\_\_\_ Plans for the Relief of Broadway by Means of Parallel Electric

Heraid Systems. WORK THAT IS NOW UNDER WAY.

Mr. Crimmins Tells What Is Being

Done and What Will Be Done in the Nezr Future. The Metropolitan Traction Company is

alminer at a uniform electric system of street aiming at a uniform electric system of street cars all over New York, using a sub-trollipe or underground plant, and combining by transfers all the lines of the tratifies com-pany. Azil, according to John' D. Crim-mins, It is expected that the achemo will be realized at no distant date. "Our canvascers are now at work along Tenth awane," he said yesterday, "guitting Tenth awane," he said yesterday, "guitting the consents of property owners to a change from horse to electric power. The Eighth from Brows to ricettre power. The Blighth request line will petently be equipped at the same time with electric motors, and the Sixth pricess line will ose of flow. How some face-flower is the same time with electric motors, and the Sixth pricess line will be sufficiently as the same street traction, the advanced method of sirect traction, the sub-trellar, persent, will be realized, when it is known that workmen are already engaged in Lectron revenue, at Stoth street, and the sub-trellar persent to be order at an early date on that expose from 18th, arrest and the sub-trellar persent to be ordered at an early date on that expose from 18th, arrest and the sub-trellar persent per

metter for the electric plate the tour old kind own years that me the electric plate the tour old kind own years that me the electric plate the electric plate that the electr

The first text desired and programment of the progr

the work of the control of the contr

THE HOPE DIAMOND.

The Research Stevery of That Understand Conserved of the Management Stevery of That Understand Conserved Co



Description flow years I make a fixed the late above the late above by the housest. But it is under the late above the late ab

and the second second second second

2068

3256

ENGLANDS LATEST WAR. \ THE EXPEDITION TO CHUTRAL

POMETHING ABOUT UMBA RHAN, THE MUSICAR OF CHITRAL AND OTHER WILD CHIEFTAINS.

COUNTING ADDITION ADDITION. THE MINISTRA OF CHITTAIN ADDITION ADDITION ADDITION ADDITIONAL THE MINISTRA OF CHITTAIN ADDITIONAL THE MINISTRA OF THE MINISTRA OF

became he heatened across the fromfer to handle for the contraction of the contract of the contract of the law convergeding breaker, the other, and when the heatened contract of the contract of the contract has according to the contract of the contract of the heatened contract of the contract of the contract Anna China, Unou was exclusion of the third according to the contract of the contract of the contract of the state acquired purer in an erholden and articles according to the contract of the contract of the state of the contract of the contract of the was-les of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the co-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the contract of the con-tract of the contract of the con-tract of the contract of the contract of the con-tract of

A state over the given. They are selled as and started well in part size, which another hard for the started well in part size, which another hard for the started well in part size, which and the started well in the started we

Construction of the construction of produced pro

when falls or could never on subtilingal trans-Sees, or a long promote that the Veryl erreic-cul alterior never is a substitute of the The part theory on any sweeter of refraint-tenancy of the Veryl of the Veryl The part theory on any sweeter of refraint-tenancy of the Veryl of the Veryl Sees of the Veryl of the Veryl Sees of the Veryl of the Veryl Company of the Veryl of the Veryl Company of the Veryl Company of the Veryl Sees of the Veryl of the Veryl Sees of the Veryl Sees of the Veryl of the Veryl Sees of the Veryl

tion in table, few forces, the state of the testify.

See I will clear up the mystery of that also by explaining low those things may be done, in India or America. THOMAS STEVENS.

of the villages on the Pashiver librer lost this del with library lost this del with library lost the lost of the sea of the Albanded of these as of the Albanded of the sea of the Albanded of the lost of the sea of the Albanded of the lost of the mere popular and the more successful. While the Amery was engressed in the campain with Inhak, timen invoked Diffusion of the Relation of the University of the Commence of the Commence of the University of the Commence of the Commence of the University of the Commence of the Commence of the Commence of the sast the latter in 15th by an Achiena expedition un-banas kept quilet, wasteling the course of events, but instituting his Independence of the Americ. The murder of the Mehtar of Chitral, Afgul-ul-

The murder of the Mehtar of Calitral, Attail-shift, its 1834, caused a revolution three and led directly to the present compileations. Actail-shift, and only a few months before bearman Mehtar, on the metry sequired power, the nucle. Shere Aton, its nevery sequired power, the nucle. Shere Aton, who had been for some time a relaigee with the Amere, was intriguing to turn him out and subset to reins of power, and it was not only the ballthe relax of power, and it was not only the bold-ness of the relocable be planned, but also the consider-nae of the relocable be planned, but also the consider-nation of the relation of the relation of the relation of the second of the relation of the relation of the relation of the hard perpetutated a nerice of creatives and numbers that disturbed the conditions of this most trustical of the relation of the relation of the state of the re-tard of the relation of the re-sea pure smooth to predice the remainder, after of the relation of the relation of the relation of the thread all were in an fertificioning, and eletther ce not be east able to prove that it was in their pos-session. It is two likeway to have well-different productions of the relation of the relation of the re-search. While the relation of the relation of the re-search of the relation of the relation of the re-tardance of the relation of the relation of the re-tardance of the relation of the relation of the re-tardance of the relation of the relation of the re-tardance of the relation of the relation of the re-tardance of the relation of the relation of the re-tardance of the relation of the re-tardance of the relation of the relation of the relation of the relation of the re-terior of the relation of the relation of the relation of the re-terior of the relation of the re-terior of the relation of the relation of the relation of the relation of the re-terior of the relation of have found out how to make men respect me-that

, kill them."
He rest to death all his brothers who had any The year to death all like besteres who shad a class to the threat is a mult procedure and class to the threat is a mult procedure and class to the threat is a mult procedure and class to the procedure and the after the most exalted pretensions, appointing min-

chemicals in accountly designed, to want to see the change of the control of the change of the chang

20.00

#### JANUARY 31 1909. = ONLY BLUE RAYS

#### HEAL DEEP TISSUES

Light of Other Colors, and of Therapeutic Value, Does Not Penetrate

#### DR. WINKLER'S EXPERIMENTS

Viennese Laboratory Worker Solver Some Perplexing Scientific Problems.

In the opinion of physicians the studies In the opinion of physicians the studies and deductions of Dr. Petrikinad Winkler of Vienna in regard to the properties of the skin by light are especially of value. The researches previously consected contradict each other more or less, and do not proporly answer the two important quentions, it is said, as to white

Dr. Winklasis Penastruants

"Dr. Winkler, therefore, divided the light spectroscopically, and made his ex-periments under very high light intensity. He found that in normal as well as in experimentally changed conditions the skin showed less penetrability for the skin showed less penetrability for the violet and blue rays than for the other colors of the spectrum, while ultraviolet rays did not even pass very thin layers of tissue, such as the very color arabit. Ultraviolet rays will therefore this use. We can reach the deeper this use. We can reach the deeper this use. We can reach the deeper this use, with the following rays, which are cited in a seconding scale; green, yollow, and an according scale; green, yollow, and

can refere, this dece-stated itsures only can receive an according analist green, yellow, and """. This shows, therefore, that blue, view, and """. This shows, therefore, that blue, view, and the property of the property o

Only Blue Rays Available. Only Blue Rays Available.

"If we adopt this to therapsules we must add that this is only the case if must add that this is only the case if the case of the case

COST OF MOTOR CARRIAGES.

FURTHER HIMINISH ADVANTAGE OVER
HEAD OF HORSES.

THE ORDINARY OF HORSES.

HOWER SHAPE AND ADVANTAGE OVER
HEAD OF HORSES.

HOWER SHAPE AND ADVANTAGE OVER
HORSES.

HORSES AND ADVANTAGE
HORSES.

HORSES AND ADVANTAGE
HORSES AND ADVANTAGE
HORSES.

HORSES AND ADVANTAGE
HORS

ELECTRIC CARRIAGE NOW IN USE IN PHILADELPHIA.
(From The Maker and Dealer.)

As low a price in EMS This new light-round gard liver of the journal with a complete rings weight early fill promised and complete, and the private and the large state of the journal with a complete rings weight early fill promised and have been and have been described who shall relate the said have been and have been and

CANADA'S PHOSPHATE MINES.

ASABANY SPIGOSPIANE SISSEE.

A California in all "Security Course for this security country of the security of

34610-HAS NOT DONE IT YET.

But Edison Is Confident He Will Soon Be Abla to See the Entire Skyleton of a Living Map.

eton of a Living Mun.

The statement was published yesterday, with liborataiour, that Thomas A. Bellion "dast Piday secceeded in penetrating the human body with the safeed eye. He looked into the heart and lungs and examined the arteries, the blood vessels and muscles of one of this austination." "He has lab! hare to the eye of the physi-

"He has full lare to the eye of the physical clan and the surream," the report indeed, "avery ornan and those and bone of the human body." It is a surream, "the report indeed, "avery ornan and those and bone of the human body." It is a surream to the surream to the human body. It is a surream to the human body. It is a late! After resulting a few many and aboved bin the article, and be instantly exclaimed, "It's a late!" After resulting a few human body. The human body is a late of the human body is a

see partially through the neck, but that is ""Ye not yet been able to get through the head or the theory, or to see the rike, or the stormen and abstance, or the petria." It saw illustrates the petria of the new illustrates the petria of the name. The difficulty now is to hold the vacuum in the tuber when a sufficiently to be a perit of bombardurent of the place for molecular with pass entires through the to be a perit of bombardurent of the place for molecular with pass entires through the sufficiently in the period of the place for molecular with pass entires through the part of the pass entires the part of the pass entires through the part of the pass entires through the part of the pass entires through the part of the part of the pass entires the part of part of the part of part of the part of p

THE PETROLEUM COSTS LATTLE.

THE PETROLIUM COSTS LATELLE.
Heavy H Rogars, of the Simulated Oil Company, is enthusiastic on the subject of horselves carriages, anthough he say, that fail interest, must be purely and though the say, that fail interest, must be purely on any strong formand for a special rate for petrolium for howeless carriages use, as the cost of the found for howeless carriages use, as the cost of the failed should be a supplied to the same of the failed should be supplied to the same of the failed should be supplied to the same of the failed should be supplied to the same of s now only about a cent or one and one-half

here horses the a borriors exercise should rest,
for one of these wholes, but was would be lost to,
for one of these wholes, but was would be lost to
for one of these wholes, but what would be lost to
for one of the second to the lost to the lost
in the lost to the lost to the lost
in the lost of the lost to the lost
in the lost of the lost to the lost
in the lost of the lost to the lost
in the lost of the lost
in the lost
in the lost of the lost
in the lost

where I is smooth that former entired to the work of the control o

AS TO ELECTRICITY.

One on a process. The state of the control of the c



Final Thirty-fifth street, a few days ago, presumably to go on the stage, surrendered beyond the first said verbing. She said Johnson had been cruel; that the was eighteen by the first said the said Johnson had been cruel; that the was eighteen by the first said proved that the was eighteen by the property of the first said proved that the was the denied that he had ill treated the gift and proved that the was only not the first said proved that the was only not the first said proved that the was only not the first said proved that the was the first said the first said

Lendon will be quite as desume as is now produced lesiveen New York and Albany, produced lesiveen New York and Albany, and the state of the singing, buzzing or human control of the state of the singing, buzzing or human control of the state of the stat

A RUNABOUT WAGON WITHOUT A HORSE, (From The Maker and Dealer.

is that, for a white can certainly be made to go up a steep hill, has a wagen run is poiled up one. Of course, it has got to have more power to go up a steep hill, has a wagen run is because the case of the course of the cours refer at 1900, tell on pine. The second of t

ON INCONVENIENCE OF THE GRANU.

If it is difficult to fare not the possible for a few the possible for a few the possible for the possible for a few the firminate in the present matter, in order to provide the possible for the

A RUSAGOINT VARIOUS VARIOUS VARIOUS VARIOUS VARIOUS AND CONTROLLED VARIOUS VARIO

3063

HORSELESS CARRIAGES, spilling lines in Parks before the engineering of the Parks before the engineering of the Company of the

Water Colored

ONE OF THE DAIMLER MAN CARRIAGES.

The state of the s



ONE FOR THE FAMILY.

and the second second

LOOKS THROUGH PLANKS.

Edison Does Away with Plates and Radio graphs and Sees Hidden Ob-Mcd 16 Jean Directly.

Med. | Le Senv Directory. | High content of the content has been acquired to the content with prevent of the content has been acquired to the content has been acquir

the country.

Each was put to the test of its ignition, cushility and itsorcescent qualities. More than 1,000 chemical consepands were experimented with before the one observed was found. It was a consequent with left and been insule for Air. Edition by his sheen all the same area, and the been forgotteen.

...

when the man for his plane has been some the first years. The source of the source test years. The source is the source of the source of the source test of the source of the source of the source of the source test of the source test







#### 3465 PENNINGTON'S AUTOCAR.

Is Light, Fast, Comfortable, and At-tracted Attention in London.

In Might, Tord, Connectessible, and AlPirens his Discover Stilling of the Hersellin
(1) Private his Discover Stilling of the Hersellin
his Production may record to the Production of the Production and Production his Production has been desired to the Stilling of the American, whose particle have been seeded to the Discover of the Foreign Connected to the Discover of the Production of the Discover of the Discover of the Production of the Discover of the Discover of the Production of the Discover of the Production of the Discover of the Production of the Discover of the Discove

weights 120 pounds. This is at most one-fifteenth of the weight of the ordinary type of engine. The Pennington fan propelled bicycle was



also on show, as well as the Hus

#### au66

NEW TYPE OF AN AUTOMOBILE. M. Leon Bollee Brings Out a Tandem Tricycle That Moves with Its Own Power.

(From the Stronens Bollites of the Herabil.)

165 Pelit Journal made a feature, youterlay morning of a description of a new attemental to a feature. A stronens and the stronens and to be a wat free provenent on anything with the stronens of the stronens

yet been produced. yet been produced.

This "volutretle," as one contemporary describes 31. Belife's machine, is sensorthan; contemporary creek. It has three wheels and is very little bigger than an endinary trigreis, and yet has comfortable seate for two persons, who all. The framework at the volutretle' is made of rated later, three wheels are little, the volutretle' is made of rated later, the wheels have the contemporary of the volutretle' is made in the later of rated later, the whoels have the contemporary that is not to be contemporary to the contemporary that is not to be contemporary to



In front base the steering geogratisched.

The transposition than the training of the steering steering the steering steering the steering steering to the steering to steer that the steering to the steering to the steering to the steering steering to the steering steering

special committee of the Automobile which is making the arrangements for ice has manimously voted a resolution a mether entegory, which will allow 1.0on-Dolloe's "votturette" taking part

3469

### CURIOUS ACCIDENTS.

Wonderful Occurrences Known to Doctors as Having Befallen Human Beings.

SNEEZING OUT AN EYEBALL.

A Toothbrush Swallowed by a Weman Not Removed Until Sixteen Years Later.

LIVE SNAKE IN A WOMAN'S ARM

Combustion of the Body-Swallowing the Tongue and Bones Frac-



The man, a machinist, in the employ of the

"Now man, a machinid, he ine employ of the East Ritter Lord Changes, was in clarify to Can Hiller Lord Changes, which course of a machine which converts makes look lists owner, and the long that the long that performed though an apperture one-clighth of an Inch in distance by a balvariable being the force of the long that the long through the l

He had select the virte and gives it the mean poll and jeth; when an expletion occurred, and Scanlain was harded to the floor, unconscious. Scanlain was harded for the floor, unconscious. On the way to Bellevier Houpital Scanlain, in the anthulance, received his series and expressed himself as feeding all right, with the exception of a little series is hab test arm, at

personal bounded on feeting all spirit, with his feet delice.

The spirit of the spiri

out this of a viscous is looted travellan was the strict of the strict o

Visition: Home, were tilled, het willieft was reasonable and the first tills streetly large were midd, and the first tills streetly large were midd, and the first tills streetly large were till till streetly and employed probabilities for the first streetly and till streetly of the first streetly and till streetly an

HIGHTHE BOATS.

THE PROPERTY OF A STATE OF O

3475

The state of the s

See the second s

The manner of the second of th

# DIRECT FROM COAL.

Dr. Jacques, of Boston, Claims to Have Made a Wonderful Electrical Discovery. May 10. 1896.

WITHOUT ANY COMBUSTION. Herach His Description of the Methods He Em-

ployed to Solve the Long Sought Problem. \_\_\_\_

IS NOT NEW, EDISON SAYS.

Has Been Working on the Same Idea, and Has Patents Covering Parts of the Process

The THEMPLEY TO THE MEASURE AND A SHEET OF THE M

Links has hanging to start of corbin. The corbin co

EDISON SAYS HE HAS HEEN WORKING ON THE HEAL HOURT TEARS.

I showed the foregoing despatch to Thomas A. Edison, whom I found at the Electrical Show in the industrial Building. After care Show in the Industrial Building. After care fully reading the despatch Mr. Eddon subject that the property of the despatch Mr. Eddon subject is on the use of heated from chambers uith carbon electrodes, immersed in mitted causation of the despatch of the despatch of the carbon, such patch into which sir is boson, if have also patenties the carbon, such as the use of cardo of from and cardo of copper, instead of the carbon, sare on the useful.

2473

of gath of time and earlier of opport, instead

Annual Control of the Control of

WHAT TESIA LEARNED

WHAT TESIA LEARNED

The second with the supposition to the state of the horselect of the state of the

EDISON'S SURGEON'S AID.

He Is Completing an Apparatus by Which Bodies Can Readily Be Explored.

The property of the property o

NOT SHADOWS ONLY.

Experiments Upon the Hadel Produced and when the second section of the Stall and Drownings

Drownings

ODDINGES OF MERITAL STREAMS

Pleasmann Found The Indignits That Found to the Indignits That Foundation of the Indignits Indignits That Foundation of the Indignits Indignits Indignits Indignitis Indignital Indignitis Indignitis Indignital Indignitis

The state of the s

from the railread station to his heart in a gale of wind. As he twented a corner an English sparrow strave him in the face. Its bill plerced his cretail and rained his side.

All the best possible that are larger of the contention of the property of the contention of the property of the contention of the property of the content of the property of the content of the content

"Various tabues, very sittle, that without were treed, and with the second war to be second with th

the state of the s

from the milreed station to his hetel in a gale of wind. As he turned a corner an English squrraw struck bits in the favor. Its bill pierced the creball and ruined his sight.

3470 ELECTRIC BOATS.

SUM 1000 1895
USES FOR REFERENCE AS INFORTANT ON WATER AS ON LAND.

The second of th

which is one as a ferrolish of the Solderst .

"All thin below the the power from themselved ."All thin below the three three

"The STATE of MANIES AND ADDRESS OF THE STATE OF THE STAT

The Market of the State of the

The matter of the control of the con

### DIRECT FROM COAL.

Dr. Jacques, of Boston, Claims to Have Made a Wonderful Electrical Discovery. May 10, 1896

WITHOUT ANY COMBUSTION. Heraid

His Description of the Methods He Employed, to Solve the Long Sought Problem.

IS NOT NEW, EDISON SAYS.

Has Been Working on the Same Idea, and Has Patents Covering Parts of the Process.

Bet TRANSPART TO THE PERSON.

JAMES Dr. Jacques formed the idea that the oxy-gen of the sir might be made to combine with earbon, not directly, but through the intervalsal electrolyte, which should early intervalsal electrolyte, which should early electrolyte he selected caustic sola-the had, conceived (of. a. "cell," which, al-though a generator of electricity, was in no scines a misunci battery.

sense a galvanic bettery

Mos ms up 17.

To carry out this conception, according to the account he took an iron ps, which he can be took an iron ps, which he can be took and iron ps, which he can be that the ps to cause it sell. That this he pst cause it sell, applying the at normal temporature is a solid, Applying heat and raising the mass to the moderate temporature of 20 degrees it tuned. He now had a liquid electropric.

Here the property of the extra control of the contr

EDISON'S SURGEON'S AID.

He Is Completing an Apparatus by Which Bodies Can Readily Be Bunlored ----

The most practicable application yet made

The new presentation of the control of the control

2473

d shedow taken by the invento

The second of th

Experiments Upon the Head Produced
Warmh Inside the Gibell and
March Inside the March
Gibell and March Inside the March
Gibell and March Inside the March
March
March
March Inside the March
Mar

#### 3445

A cases describe to the Sun to day tells of a remarkable discovery reported to have been made in Italy in connection with the investigation of Prof. Rönigen's new force in pho-tography. Prof. Salvioni of Perugin, in a paper rend before the Rome Medical Academy described an outlest instrument of his in vention which enables the human eye, by means of the Röntgen rays, to see through anything which then mys can remoteste Dunesa 1893, necording to the latest issue of

the official year book, 766 Japanese students and officials received passes to study in Europe and America. Eve 152 Fee //

#### Corporate Fuer of the 127 mays.

Thomas A. Edison worked until three able the recorder exterimenting with Prod. Röentgen's X-mys and their accompany-ing phenomena, and after breakfast relarned to the mak. He discovered this morning the to his work. He discovered this morning this the X-rays were strong enough to influence and make an impression on a photographic plate at a distance of seventeen inclus. Eight inchat a distance of seventeen incluse. Eight inch-ces was ton generical Heimes at which a photo-graph had teen uttempted before. Mr. Dif-sen regards this as impostent, as it tends to prove the theory that the X-rays go off into space instead of simply making a local elecult between the electracter or poles in the take, as would be the case were they only regardite

Interesting results were secured from a cardtourd containing specimens of thirty sub-stances, placed between the Crookes tube and the photographic plate. Iron, brass, lead, tin, nathmony, bismuth, endmism, platinum, cop-per, and coin silver were found to be almost entirely impervious to the rays; gettingurelus, shote, ivory, velcanized fibre, phonograph cylinder substance, and hard robber offered considerable less regist. nnce, while the mys went through resin, stearle, nedd, nephalt, albumon, and soft rubber, and hoft but faint traces on the white. The rave penetrated aluminium, gelatine, sheliar, borin neid, pener, campbor, and amber without leavlor unv disperable trace on the renterests g any discorning trace on the photograps. This afternoon Mr. Edison experimented on the lines of the theory suggested by Sylvanus Thompson, the English scientist, that the X-rays are really sound waves at the rate of

#### several thousand a second. 3448

Accounts Water Williams Sury 1896 the discovery by Professor Routgens of the new conductor of light, by which a man can be obotographed without firsh or muscle, but as he is in his bare bones. The results need confirmation, but it seems probable that the discovery may be of great importance in surgery. Metals, as well as bones, are opaque and east a shadow in this nex-process. It follows that a builtet can b photographed when imbedded in the body. In President Gardeld's care it would have been possible by this new method to ascertain by the camera where the bullet was without the use of the probe or the inductive balance. L. N. F.

Possibility That Roontgen's Discovery May Resuscitate the Apparently Drowned.

\_\_\_\_ RESULT OF AN EXPERIMENT.

A Mouse That Had Been Under Water Fifteen Minutes Revived Under

Her and Fel / NEW NAME FOR THE SHADOWS. 1896

Me. Outsteller Soys the Pictures Made Should Be Called Steleograph, Net Cathodographs.

Next show also like larkerich by Proteony and Control of the Contr

DIFFERS WITH ROENTGEN. Professor Michelson Has Mado a Theoretical

other, but no mich were tempede his been been war in the property of the prope

An Outscheep then housed for puregeneral and the second of the second

TUFTS HAS A PIONEER

Profestor A. E. Dolbear Experimented with Cathoda Rays as Long Ago as 1892. Calhode Says at Long Age as 1892.

[IN TELEGRAPH TO THE BERALE.]

BESTCS, Mass. Feb. 3, 1892.—Totts College ranks among the first American colleges in the completeness of its electrical laboratory, Professor A. E. Dolbers, who is at the head the Complexations are not not constructed in the construction of this department of instruction, is a pieces relief to the department of instruction, is a pieces relief to the construction of the construction of his production of the construction wive, above properties are accessor sometimes, and the control of createst fineres.

In the recent between the control of createst and the recent between the control of createst and the recent per many control of createst and the control of createst and attitudes to expect the investments and attitudes to expect the investments and interest in the control of the investments in their to in the control of the investments and there is not the control of t

UNION HAS FACILITIES

But the Experiments Have Not Seen Outs as Successful as Could Be Wished

Securities to could be selected.

Securities to could be selected by the security of the manufacture of the security of the se

NO SUCCESS IN BROWN.

The University Does Not Possess the Apparabs for Such Caparinests.

[Preventional Tro Test Research

[Prevention Tro Test Research

The Such Caparinest State State State

Based State State State State State State

Based State State State State State State

Based State State State State State State

State State State State State State State State

State State State State State State State State

State Stat alus for Such Experiments.

#### 3479

MR. TESLA IS RETUGENT.

Has a New invention, but frequency for the first that the as the as to believe the inventions before the the would only any that he was continued to the theory and the theory as the theo

#### NO PHOTOGRAPH

3480 OF THE BRAIN.

Edison Not Able to Make the Erperiment Recense He Couldn't Get the Tubes Right. 

SUBJECT IN NO DANGER.

----Not Enough Amperage in the Roentgen Rays to Harm the Person Hald Experimented On.

INTERESTING PHENOMENA.

Fil 11 -- 1896 Comments of the comments of th

Duniso 1853, necording to the infect feets of the official year book, 766 Japanese students and officials received pages to study in En-rope and America. Eur 101 Feb //

### Gue Land Ten ft 1696

Thomas A. Edison worked until three o'clock this morning experimenting with Prof. Röenigen's X-rays and their accompanying phenomena, and after breakfast returned to his work. He discovered this morning that the X-rays were strong enough to influence and make an impression on a photographic plate nt a distance of seventeen inches. Eight inches us the greatest distance at which a photograph had been attempted before. Mr. Edison regards this as important, as it tends to arove the theory that the X-rays go off into space instead of simply making a local circuit between the electrodes or poles in the tuke, as would be the case were they only negative

nives. Interesting results were secured from a cardboard containing specimens of thirty substances, placed between the Crookes tube and stances, placed between the Oreokes tube until the photographic plate. Iron, brass, lead, tin, antimotoy, biseaseth, eschusium, platimum, cop-per, and coin silver were found to be ulmost entirely imperations to the rays; guttaperchu, sinte, ivorg, vulcanized fibre, phonograph cylinder substance, and hard rubber offered considerable less resist-ance, while the rays went through revin, stearle, acid, asolult, albumon, and soft rubber, and left but faint traces on the plate. The rays penetrated aluminium, printine, shallor, boric acid, paper, campbor, and amber without leaving any discornible trace on the photograph.

This afternoon Mr. Edison experimented on the lines of the theory suggested by Sylvanus Thompson, the English extentist, that the X-rays are really sound waves at the rate of several thousand a second.

#### 3448

Acrounts are published from Vienna of the discovery by Professor Routgens of the new conductor of light, by which a man can be about graphed without flesh or muscle, but as he is in his bare hones. The results need confirmation, but it seems probable that the discovery may be of great importance in surgery. Metals, as well as bones, are opaque and east a shadow in this new process. It follows that a built can be photographed when imbedded in the body. In President Garffeld's care it would have been possible by this new method to ascertain by the camera where the builet was without the use of the probe or the inductive balance. I. N. F. 

Possibility That Roentgen's Discovery May Resuscitate the Apparently Drowned.

RESULT OF AN EXPERIMENT \_\_\_\_

A Mouse That Hat Been Under Water Fifteen Minutes Revived Under Heraid Fel 1

NEW NAME FOR THE SHADOWS.

Mr. Osterberg Says the Pictures Made Should Be Called Skotographs,

Mr. Osterberg Says the Picture Made Should Be Golden Stolegraphs.

Not Cathodographs.

Not Cathodographs.

Not Cathodographs.

from whom Mr. Osterberg, obtained permission to use this hieratory.

Mr. Osterberg, who grashed of row Columstate of the Columbia of the Columbia
And Columbia of the Columbia of the Columbia
Osterory, and has made a great many experiments in the bestergraphing of invisible
of the Columbia of the Columbia of the Columbia
make a picture of the skeleton of a monia,
and directed same of the attaches of the collines will be columbia of the Columbia
to the Columbia of the Columbia of the Columbia
to the

be some modes it, and that they would have
rear, but no make we transpel out the
rear, but no make we transpel out the
many rearrange to the control of the
many rearrange these hoods does
of the control of the control of the
many rearrange these hoods does
of the control of the control of the
many rearrange these hoods does
of the control of the control of the
many rearrange the control of the
many rearrange the control of the
many rearrange that the
many rearrange the control of the
many rearrange the control of the
many rearrange that the
many rearrange that
many re

we've drone you have believed by Protongy, and the protongy of the protongy of

DIFFERS WITH ROENTGEN. Professor Michelson Has Made a Theoretical

Study of the Subject.

[DT TELEGRAPH TO THE HERALD.]

CHICAGO, Ill., Pely S. 1854...Profossor Michel-

"Write money will be appropriated for the purpose?"

Purpose?"

Accratin sum is set apart each year for the maintenance of this department, and any ex-pense 1 may so to in this connection will be "Have any leedures my them delivered to students on the subject to later on. I am of the opinion this surviversity is semewhat be-hind the other institutions of this country in the havestigation of this matter.

markable properties of the cathode rays in-vestigated by Professor Roenigen.

He says that great interest is felt in the discovere, especially as these rays differ as-remarkably in their properties, not only from ordinary light waves, but from the electro-magnetic waves studied by Heriz and others. What relation these may hear to layer de-

Mr. Colestrier, then harded himself for more based on the colestrier, then harded himself for more parties and a that there and no other cheeper and the colestrier in the col where, whose properties are arreasy some-file the properties are provided with file the properties of the properties of the other properties are and although to exceed, appropriate has a full similar of the other properties has a full similar of the properties and the properties are a full similar of the properties and the properties of the properties and consideration of the properties of the properties of the local life where we shall be such as the properties of the local life of the properties of the properties of the local life of the properties of the properties of the local life of the properties of the properties of the local life of the properties of the variation with a properties will complete the in-UNION HAS FACILITIES

of the control of the

NO SUCCESS IN BROWN.

mary footbly basion in remodelative superior of creative process. The control of the control of

also for Such Experiment.

[19 THEMSELT OF MERCHANT OF THE MERCHANT

[19 THEMSELT OF MERCHANT

[10 THEMSELT

[10 THEMS rious people harv used the word masses rough, but it does not seem to ree that an except, but it does not seem to ree that an register to the seem of the seem of the finished to it.

I would be the seem of the seem of the time of the seem of the seem of the time of the seem of the seem of the people of the seem of the depth of the seem of the depth of the seem of the depth of the seem of the seem of the depth of the seem of the seem of the depth of the seem of the seem of depth of the seem of the seem of depth of the seem of the seem of depth of the seem of depth of the depth of the depth of de 3479

TUFTS HAS A PIONEER.

Professor A. E. Dolbear Experimented with Cathode Rays as Long Ago as 1892.

Califord State at Long Ages at 1992.

Jay Tanashari Oyan Benahi Golombari Oyan Califord State at Long Ages at

NO PHOTOGRAPH

3480 OF THE BRAIN.

Edison Not Able to Make the Evperiment Because He Couldn't Get the Tubes Right. 

that the Experiments have first from plant as Secretaria and code in Window. Secretaria and code in Window. Secretaria and code in Window. Secretaria and code in Window for the Code of t But the Experiments Have Not Boon Quite as Witnest announced that, until he had get

When the second control is the second control is a second control in the second control in the second control is a second control in the second control in

MR. TESLA 18 RETICENT.

Has a New invention, bet Refuses to

"To I Test Bloom to Dynama."

The femile of Nieles reast the destreast
wards of Nieles reast the destreast
wards of Nieles reast the destreast
wards of Nieles are the destreast
were saying pasteriny be had developed
to X my feet will be was now relied to
for as to pattent his inventions before
giving them to a waiting words.

Totals was saided about this new discovertest and the said of My of that be man week
ment and the said of My of that be man week-

The University Does Not Possess the Appar-

alus for Such Experiments.

inc. He would only say that he was week-ing quietly, and that strong began of devel-sping something vulnable. He deducted he was not through with his investigation, or forcing would through soulds hady or of forcing would through soulds hady or forcing would through soulds hady or they was condeared a sould, while it was, the record thin the sould be a sould be the sound thin the sould be a sould be sound the sould be a sould be a sould be sound that the sould be a sould be sound that the sould be a sould be sound that the sould be a sould be sould be a sould be sould be a sould be sould be a sould be sould be a sould be a sould be a sould be sould be a sould b

3081

If I' SECRETALLY AND EAST OF THE SECRETARY A Roenteen plate. The encysted missile was ex

QUICK WORK WITH X HATS.

Mr. Edlson Succeeds in Making Picture with Seven Seconds' Exposure. ORANGE, Feb. 14 .- As a result of the exper OBASOR, Feb. 14.—An a result of the capaci-ments which Thomas A. Edisen has been making with tubes to produce the Reentgen-rays, lo asmounced to-adult that within twen-ty-four hours he expected to have so far per-fected his tubes as to be able to make susp-fected his tubes as to be able to make suspshot photographs through any substance of

their histories through nor relations of the property of the p ful trackles has asking's secrets its two neight strikestabilities. So was nearly ready to strike the strike that has a same secret ready to allow the superincest of photographing of the strike that he would stop have further would stop his experiments and leave further exclusions for others. Any personnel of the strike that have been superinced to the line of tempering initials with the rays, at least at present.

USED A SECONDARY CURRENT. Beault of an Experiment with X Rays by Prof. Sturr of Buffalo.

Burrano, Fela M.—Dr. Elasor G. Starr, who has been experimenting with the Recentgen discovery, made a photograph to-day through an epoque substance without using the Creokes tube. Acting on the theory that the X rays section and anticompletion strain the Common section control and the Common section common section control and the Common se EBRUARY 15, 1896.-SIA1.

### CATHODE RAYS 3482 TRIED IN SURGERY.

Dr. Morton Experiments in the Case of Malformed Bones in a Child's Arm.

FAIR RESULTS OBTAINED

With a Very Strong Current the Details of Fractures Can Be Seen.

EDISON'S BRAIN PICTURE.

At his inhoratory, No. 19 East Twenty At his inhoratory, No. 17 Law a week-ciphth street, yesterday afternoon Dr. Wil-iam T. Mortos, who has been conducting elaborate experiments with Roentgen rays, made a practical application of them to surchannel article, yearloang all referent flows they channel article and with flowerings more channel article and with flowerings more channel article and with flowerings more channel article and the state of the st

the base dready made good philadequisite and the committee of the committe

USED IN A SURGICAL OPERATION. Louis Burkhardt's Hand Was "Photographed"

and a Buckshot Removed.

THAT PICTURE OF HIS BRAIN. A Sceptic Who Says It Bears Unmistakable Signs of its Roal Nature. To THE EDITOR OF THE HERALD:-

I notice with regret the rush of sensational

WORKING WITH "X" RAYS by Professor Punin in the Colum-

bla College Laboratory.

In the laboratory of Columbia College Pro-fease Pupin was bury the better part of the Pupin was bury the better part of X rays, the purpose of life experiments being to device a plan whereby instantaneous piles to device a plan whereby instantaneous piles at a plan whereby the part of the part of staller medium, with the sport gap and a staller medium of column or collection of the collection of the part of the sport gap and perfect with an instant's supposer. On the plant years of the part of the part of the high remitted plant Professors Pupin high research plant Professors Pupin high high remitted plant Professors Pupin high professors plant pl One determ researcher was rememballe, On better searcher of the property of th

Professor Trowbridge, of Harvard, Mokes In-

stantaneous Photography Possible. than states Pathopoly Possible. He recovered to the recov

. The Rangen Bays. TO THE EDITOR OF THE EVENING POST:

For in Eurone or the Eurone Port:
Ona The following attented course in your
report on cathody pholography experience
Eschedith School of Harrard And Levence
Eschedith School of Harrard And Eurone
Eschedith School of Harrard And Europe
Eschedith School of Harrard And Europe
Eschedith School of Harrard Eschedith
Eschedith School of

Such a theory was not advanced by Prof. Such a theory was not advanced by Prof. Rontgen. On the contrary, he states expressly in his easy, section 13: "The rays are generated not only in glass. I have obtained them in an appearatus closed by an absentational pinte frame thinks, it propose to investigate inter the behavior of other subclassics." Mr. 1 Privat. Ontenna College, Polymery 27. 1879.

3484

TRIUMPHS OF THE X RAY.

Proof that the Body was that of as Itta-Prof, Bergman Uses the New Photog-ruphy in Surgical Cass-Interesting Exportments in Boston and Enswhere,

Experiments in Hesten and Externitre, Systels (olds Properts to Tite Eur.

Systels (olds Properts to Tite Eur.

Loxuon, Feb. 15.—Sensor remarkable applications of Prof. Bintegree's discovery haro been made this week. There is at the Virans Museum of Natural History as Exprisin summy which has a human form, but from the inscriptions to was taken to be that of an Bits. It is so mre and valuable that it was not ressible to d ture non-valuable time it was not possible to do the damage of spening it. It was taken to the School of Photography and photographed with

School of Photography and photographysics with X rays.

The picture obtained shows the cultimes of the large bird's skeleton and proves keyond doubt the nature of the contents. Prof. Yea Bergmanp, the fances surpeon, performed his first operation with the assistance of the Ron-ton of Theology reporting, tweety small gen rays on Tuesday, removing twenty small shot from the arm of a young man. The Proshot from the arm of a young man. "The Pro-fessor made this important statement!

"There are many arts and actiones to which
Prof. Rodington's discovery will be of greater
value than surgery. Its application to surgery
value than surgery. It is application to surgery
value than surgery. It is application to surgery
value than surgery. It is application to surgery
value to the profit of the profit of the properts it to be found by the new retiroid and
whites to have it removed.
"After many years of practice in pasce
and war. I malutais that foreign objects, the

and war. I maintain that foreign objects, the presence of which is the looky is not a source of trouble or danger, ought to be left where the rags. The connectonness of having an arter bit of lead, for instance, in each body, especially when it causes no inconvenience, deer not in the least counterbalance the danger of the oper-cation necessary for its removal, especially is this the case in war." X RAYS BY A NEW METHOD.

Interesting Experiment in Surgery in Hos-ton-More Light on the Subject.

The second of th tools, with a discharged when accorded to the very livery law of the properties of the control o

The real way have placed by the present of the pres

PROP. CLARK'S "X-GRAPHS." Invited Guesta Nee the Recargen Process at Clark University.

Woncestry, Mass., Feb. 15.-A small party Wencerran, Mans. Poh. 12.—A small party folialism and mutaness were invited to one of the holospation of Clark University venerally as the control of the co

, ..., ... • **\*5** 

THE MISTERIOUS NEW RAY.

\*\*TOTAL TO A THE ATT curries shore. His own paper, written with con-spicious necessitis causion and noderation, dis-closes observation of facts is in the bigboot degree interesting, with a superior of the paperior of the interesting with a superior of the paperior of the paperior of the paperior of the paperior of the discovery law boes selved upon with artistry, Studies of the paperior of the paperior of the discovery law boes selved upon with artistry, Studies paperior of the paperior of the paperior of the Studies paperior of the paperior of the paperior of the Studies paperior of the paperior of the paperior of the Studies paperior of the paperior of the paperior of the Studies and the paperior of the paperior of the paperior of the Studies and the paperior of the paperior of the paperior of the Studies and the paperior of the paperi Signature distorted here and every becomes a computer without projections of thesis conquisites and the second control of the second article of commerce; no illustrated paner is complete without reproductions of pictures extended some sometimes given to the word in order to describe vibrations or rays which, though invisible, are stricture of the same natime in tellin trave, Villan was have residently in a common travel of the common travel of t tupe as visible rays. When we have reached the most rapid vibrations that the ear can recognize

And the second of the second o

X RAYS AT FORT WAYNE.

Experiments in the Lubbratury of a Fort Wayne Electric Company,
Four Wayne, Ind., Peb, 16.—The fleet experiments attempted in this city of obtaining
points by the Rountgen peocest were main last
evening in the laboratory of the Feet Wayne
Electric Corporation, interesting results being
obtained. In place of Crooke tubes, an onlemore bearing toost. obtained. In place of Crooke tabes, as each; many; inscandered know of heave after was distanced by the control of the control

3484

DID IT IN SEVEN SECONDS. Heraul Folio Mr. Edison Succeeds in Catching a Photograph with "X" Rays in Remarkably Short Time. 169.6

It was announced by Mr. Edison last night that he soon expects to make snap shot pho-tographs through any substance of medium thickness, except steel or Iron, with his new tubes, christened by himself. "Phorescent Tubes." He worked until two o'elock yeater-

Links, adjustment by themself "Demonstration of the promiting and his provided token, and all the promiting and his provided token, and the control of the provided token and the provi

WIZARD SLEEPS NOT.

Edison Works Night and Day with the Mysterions Light Discovered by Roentgen.

MAKES HIS OWN TUBES. \_\_\_\_

Trying to Reach the Best Vacuum to Produce the Penetrative Rays.

TO PHOTOGRAPH THE BRAIN. Herard ----

Five Tubes Will Be Used, and the Subject Must Be Exposed . an Hour. 1896

Thomas A, follows, with a copye of assistant worked in the Grounge hasbratery all Prilary match and a first Grounge hasbratery all Prilary match and a first Grounge hasbratery and the Grown of the Tribert Constitute. The triflest Grown of the Tribert Constitute. The triflest of the Grown of the Tribert Constitute. The triflest of the Grown of the Tribert Constitute of the Grown o Thomas A. Edlson, with a corps of assist-

mainifacture.

Instead of the Crookes tubes, which have lecome very scarce in the market, Mr. Rdison employed the ordinary incandescent light bulbs, creating in them different degrees of vacuum. The results obtained were much more satisfactory than with the original

more satisfactory than with the original article, breame, the gians being thinner, a leaver proposition of the light was absorbed by the walls of the tubes.

In the course of the experiments which have been carried on with greater or less difference throughout the week, it was found that the light frem a single incandecent bath, arranged in initiation of a Crooker tule, was unreliable and likely to produce a distortion of the image. Mr. Edison there-fore resolved to employ a series of tubes, con-sected together after the munior of a hat-

CATHORIC RAYS DEPRECION. COTY. STRONG RAYS SECTIONTON.

Mr. Billion was maximum to determine whether it was possible to so produce the light in tunes of the ewar manufacture that the results solutioned might be absolute and the results of the control of th

ME. EDISON IN THIS LABORATORY.

Nothing and the control of the contr

The fact is, the rays will penetrate any-thing. The property of the property of the con-line and the property of the property of the con-tant he should probably drop the whole mat-ter as soon as he had succeeded in making the mysterious light effective, Mr. Edition down not expect to apply Professor Rome, and 11 1755001.

3491 ALUMINUM FORGED.

Edison Has Probably Discovered One of the Lost Arts in His Experiments. Heraid - Fel 13 HIS LAWYER WITH HIM.

---- 1896 By Absorbing the Oxygen in the Tubes the Aluminum Tempers . Like Steel.

\_\_\_\_ MANY WHO CARRY BULLETS.

Tests of the Refractibility and Penetration of the Roentgen Rsys Made.

Mr. Edison did not reach a point yesterday Mr. Edison did not reach a point yesterday at which be felt justified in attempting to photograph the human brain. The purpose of his experiments was to determine the in-tensity of his penetration of the rays, and the distance at which that penetration would be the montyfective.

While experimenting he made the interest-

While experimenting he mode the interesting discovery that alsemines could be made as hard as fixed as the control of the cont astrinal lightness.

IS IT A LOST ART POUND? us or a Loss and rocker; ran through the laboratory:--Has Edison found the lost art of tempering copper and similar metals? Mr. Edison has an Mex. that the hardening was produced by the absorption by the aluminum of the oxygen in the air in the tube.

in another experiment Mr. Edison noticed that a tube made with a low vacuum, after being in use, changed to a higher vacuum until every particle of air in it disappeared The only explanation he could give was that the air particles became decomposed, the oxygen probably uniting with the aluminum and the hydrogen being forced through the melasular source of the place.

Interest in this discovery was heightened by the fact that the Wizard was closeted for sime time with his patent lawyer. It was said that he intended to apply for a patent on the process if it proves natentable, though another rumer was that the lawyer's visit was in reference to the patenting of a means to send pictures by telegraph, just as mensages are wired every day. Notther Mr. Edison nor his lawyer would discuss the mut-

As usual yesterday Mr. Edison received an As usual yesteriany Mr. Suizon receive un-armful of letters from persons who have frac-tured limbs or hollets in their bodies, and want him to turn the Reentsen rays on them and let them know just where and what the rauble is.
"Some of the writers," he said, "are mer

"Some of the writera," he said, "are men and women of prominence, and one of the men is a Supreme Court Justice in a neigh-horing State. It is singular how many per-ouss have bullets in their bulles. Probably-more than half of those who have written me are afflicted in that way."

EAYS TO KILL BACTERIA.

Phone Mr. Evilson per to talking about th Then Mr. Someon not to taking amount the possibility of the X rays being used to kill the bacteria of tuberculesis, typhoid fever, hydrophotia and kindred maindles, and he sald;—"I propose to see if the X rays can be zent over a wire. If they can won't it be a nont over a wire. If they can won't it he is great thing: Suppose a man set which by a and don; field rine up his decire on the rays over the wire. The doctor will do sa. The man will put the telephone receiver at the hear of his brish—for that is the place, you know, that the interest of hydrogobids with the form of the control of the control of the Winzel knowled heartiff. Winard laughed heartily, the wizam's expensioners.

One of Kilson's first experiments yesterlay was a test of the refractifility of the X rays and their penetrative power through a fun-nel more than eight froi in length. At the ldg end he placed a Crookes tube and at the small end a secultivel place behind place of caribbon). After an exposure of nearly three-quarters of an hour, the place was developed and on it was discovered the faint trace of a semicircle. This in-dicated, Edison said, some action of the rays even of that extreme distance.

#### WANT THE PLUOROSCOPE. 3092 Hospital Furreons Believe Edison's Latest

Invention Will Be a Great

Speigh 2 years are Maries Rabines Rabi

Les on et al en deut that the base Entrethene.

The control of the control of the deposited by the control of the deposited by the control of the deposited by the control of the control

#### HUMAN HEART 3493 STANDS REVEALED

With the Aid of a Fluorescent Screen Nikola Tesla Can See It in a Cua Living Subject. Of U

NATURE FULL OF X RAYS. The Sun and Other Sources of Radiant Ener-

gles Have All Antics, ate. Beenteen. -

SOME STARTLING DEDUCTIONS.

MAMA THE CAN THE AND A THE CAN THE AND A THE CAN THE AND A THE CAN THE

show affairs than Devisity street. Neven to produce the product of terly and clearly as though it were laid tare by the surgeons scalpel. Perinary some go so far as to hope to see that living leart in arribed legibly with its nevertex. Queen blary said. that when she was dend the word Calais would be found indelibly engraved on her heart. Some fells would not be ratisfied unless Nikola Tesla revealed to them

isside unites forkola Testa revenue to use the very letters of such an interription.

TESLA IS SILENT.

Mr. Testa himself is sensible of this overweening expectation. So for the moment he
has determined to make no further reveluwasting expectation. So for the consent by the control of the cont

The re-william of that it is not a standard for the control of the

instance, the could viven distinguish the bene-year cannot expert time in its fifth or roll to backward. Therefore you cannot not the control of the country of the country of these monifestations. But you can do the order of the country of the country of the wide has not keep up with the tyroid of revents who has not keep up with the tyroid of revents for the country of the the country of the

A SAW THROUGH THREE MEN.

Michia Rus a Tack by Which be Lobt.

[II.] Intemplates Bellin 1994.

[Nisida Tesla was very low with he acceptance with a celled reconstruction of the celled reconstruction.

In the celled reconstruction area. The head a very eithering faculty acceptance area. The head a very eithering faculty acceptance area. The head a very eithering faculty are engineering a cell of the little was faculty as a cell of the ce

CAN SEE THROUGH A MAN. Hevald

with the X Rays and a Lumi-

Nikola Tesla, who was among the first to experiment with the Rosnigen rays and who published some remarkable results, has an in-

everaling seriods in the current number of the Hiertrical Heavier, in which the direction in detail his record oxportments. As a record in detail his record oxportments. As a record possume hocks, the control oxportment of the possume hocks, the house hock oxportment of the house house here the every develop elec-trical power enough to chable the rays of the house house house of the control properties of the house house of the right house house of the control graphed a mandy with and the house of the result, he says in his critical, he house house on an attained with the sidetic hereast treath, he says in his critical, he has been already hand to be a shadowyrush to which hand, and he has a shadowyrush what the hand has a shadowyrush when the properties of the properties of the companion of the vacuum properties. the same harder from the term by any street.

"An amount markers from the term by a street.

"An amount markers produce grows," he was a first of the same and th

3498

WITHOUT THE X RAYS. A Chomist in the Appraiser's Stores Photo-

A Chemis in the Saprajeur's Bases Philipse.

A Chemis in the Saprajeur's Bases Philipse.

Dr. William D. Cressible, one of the cheme
are the same of

RAY EXPERIMENTS.

Dr. F. S. Kolle, of Brooklyn, Says He Hea Photographed the Brain, and Edison
Is Confident That He Can.

Is Condident That He Cau.

Dr. F. R. Kolle, a graduate of the Hanoverlan Institute, of No. 24 Fourth avenue, throoklyn, who has been experimenting with the Rocatgers ray, states that he has surceeded in securing a photograph of a boy's brain, which, he says, was distinctly shown as a dark object with perfect outlines. as a dark object with perfect outlines.
Dr. Kolle has receively precured a new-trainsference, with which he can use a 30,000 yeltoge. He latends to continue his experi-ments. He elaims that he in the lirst to make a satisfactory photograph of the beals.

brain.

OTHER EXPERIMENTS IN BROOKLYN.

REcollent results from the use of the rays have been obtained at the Polytechnic Institute, where Dr. Samuel Sheldon has control of the property of th Inter, where the familia distribution has conperfect the second of the ducted a series of interesting experiments.

Professor Sheldon made a number of photo-

emulation, with which his chemists have been experimental; and last night that he had every reason to expect success in the making of a cathodycarph of the human brain, or, at succeeded in getting good, sharp photographs through four inches of selfs wood, and that through four inches of selfs wood, and that the succeeded in getting good, sharp photographic through four inches of selfs wood, and that through four inches of selfs wood, and that through four locations are succeeded in photographing the brain.

taskir. Freis discoveries are daily amounted in the field fles occuped by Peri. Rongero. That there is a pessibility of enabling the human eye to see writh easy concentral objects was demonstrated on Thursday at Kings College, London. One of the experimenters there says:

"Without the sixt of polarcembe, by the measure of a simple-forestent curve and a sub-measure of a simple-forestent curve and a sub-measure of a simple-forestent curve and a sub-measure of the simple-forestent curve and a sixty of the sixt "Without the old of photography, by the

and declares that he will seen to able to phe graph objects at any distance by means of X commenced to the conversity wire. He described the process to me to-day, but forbade making public the details until the experiments are complete.

They Reveal a Needle That Had Been in a Woman's Foot for Nine Years.

WAS THEN EASILY REMOVED.

Recent Experiments Show That the Rays Will Make Bone Translucent.

SHADOWGRAPHS OBTAINED.

With the aid of the mysterious N rays, pro-

With the nit of the negativities N rays, pro-chaced in vincious balls of his own make, Dr. William J. Mories, of No. 19 East Treesty-cischit street, elstainet, several days ago, a shalowgraph of the bones in a woman's fost, and was thus enabled to locate a piece of needle that had been there for zine

years.
The piece was nearly bulf an inch in length. The piece was nearly half an inch in longiturity dripations and surgeous tried at various times to locate the needle, but were unable to do so, not it had weeked usualy from the point at which it entered. The woman suf-fered much public and was unable to wour a sloon a greater part of the time. Her physiciani, notificing the success which

nttended the efforts of scientists to photograph honce in the body, took her to 'Dr. Morton's office and obtained an excellent simulousgraph of the foot, and exactly lecuted the piece of needle, which had become oxidized. attended the efforts of scientists to photo-

PROTOGRAPHING THE DOOT. PHOTOGRAPHING THE FORM.

Dr. Morton used a relate smachine to generate the elevatricity, and the woman, sitting in front of it, placed her foot on a photographic plane based where foot on the photographic plane based with the properties of the pr woman sat there, wase the X rays percen-her fost and photographed his homes. When the plate was developed it showed the banes in light shadow, but under the ball of the foot there was a dark streak that indicated

the presence of the scedie.

The woman went to the Post-Graduate Housital, at Second avenue and Twentieth

The second could to the PostConductors where the country of the co

3500

NINGLA TESTA'S WORK

OF STATES AND STATES AN

The company is the service of the control of the co

An interest of the property of

From Nature.

Sign with the control of the control

They Were Shown Distinctly on Edison's Finorescone at the Electrical Exposition.

HIDDEN OBJECTS REVEALED.

X Rays Located a Bullet in the Arm of a Patient in Bellevue Herai Hospital,

OPERATION WAS SUCCESSFUL.

IF9 6

It was Edition day yesterday at the Bre-trical Exposition, in the Graind Central Pul-ace, for Mr. Kollton, with a corps of his as-nitiants, was present all afternoon and even-ing to give the first public exhibition of his fluoroscope.
The fluoroscope was set up in the rear nor

The literoscope was set up in the rear por-tion of the main gallery, where a large space had been curtained off, so that no my of light could penetrate the place. There was a raised platform, on which were placed two tables, cluse-regether. On one the illustroscops are observed.

tunestate of calcium ervatuls, so that any object that is not opeque to the X rays placed between it and the vacuum tube in placed between it and the vacuum tube in which the X rays are generated will be-come trustparent. In the case of one's hand, for example, the fisch will disappear, and the house, heige quague, will be partrayed distinctly on the fluorecent rerea. Thus it happened that hast evening, when acquantizaries met in the half the first re-nequalitizations met in the half the first re-

There is to separate that had not ready when the man will be made to make the man of the

Celumida, Cellege "will be prevent in in boty." Creativities was recovered by the control of the

cover, there must no the reproduction, and Mr. and Andreau And

2503

X RAYS IN SURGICAL WORK. THE PROTOGRAPHY OF BROKES!

Long Exposure for a Pat Man-Blight Movements of the Subjects Not Patal to Good Results in the Rossigen Process-lexes; While the Pictures are Taken

Since the task planeture proposed.

The prince the same half been proposed to the prince the prince

account of the color will devide the band. Mischel belows a bench of the color will be colored by the colored by t

The state of the s

250U

ELECTRIC LOCOMOTIVES.

\*\*\*Sound 19 1976

\*\*SINNAL SUCCESS OF THE LOCO
\*\*MOTIVE VISID IN BALTHORE.\*\*

Two More in Course of Conference for the Hense Hond-A. 1,000-Ten Trails district from a Standard Without a Siportic Wieels—Graul Droced Possible.

Sitp of the Wheels-Great Speed Possible.

Prox the Conserved Practices' Heav Reparts.

Within the past few menths an experiment to obstrict the past few menths an experiment to obstrict the past few menths and the past few menths and the past few menths of the past few menth mit named or the Javas Separate, beef most control under the Javas Separate, beef most control under the control under t The Committee of the co

singly first common the common to the common

The state of the s

Difference of the control of the con

3505

EDISON'S WAR SCHEMES. Jan 26 - 1896

N V Sem IMPRACTICABLE. Horn Demonstrated - Others Are New and Their Peasibility is Dombiful-Hest Application of Electricity to Warfare
Made by Men Trained to the Profession -Possible Bad Results of Edson's Talk,

In an interview Which was published in Tres. In an interview Shich was published in Trus Sixs a few days ago. Thomas A. Edison talked about the possibilities of electricity as an offen-eive, and a defonitive agent in warfare. Mr. Edi-son destribed in outline several terrible oughtes of destruction to which he had given enough somedieration to be assured that they were rea-tible. Probably, me juen wide read that inter-

view were more interested in it, for various reasons, thus the efficers of the army and any who have deveted years to the unbleck about which Mr. Edison talked so githly. What these pentienes have accompilated, what schemes they have in mind, and what devices tremment they may in mann, and write developed they have projected may never become public because them may never to necessity for their use, and until there arises such a necessity all such inventions will remain the secrets of the Navy and War departments.

such insections will remain the accrete of the American Conference of the A

And the same are about that, being a softerer of the theorems, and a word which has the thorough a contract of the theorems, and the word which has the theorems was been as the same and t pedo, the flight of which was to be controlled for ten milles by the operator, which would drop 240 or 1,000 pounds of explosive on a ship or a city. Then there was a gun which should shoot twenty miles, using dynamite as a pro-

thest twenty salles, using dynamitie as a pro-pulative force.

"It is a pity," sall JL, Fishe. "bas Mr.

"It is a pity," sall JL, Fishe. "bas Mr.

It is not be a pity of the sall three things.

It is within the sall have the sall three things.

It is within the sall three things. It is a sall three the sall three the sall three things are the sall three the sall three here whether the circum in preserve one that is a boundary of the contract of the circum for a circum and the circum for the c

ialized in that interview were just like patting planes in frent on persons who short know anything about movie. You taking work the anything about movie, You taking work the of them which consisted elements of feasi-lating were, old, and three which were not, were well-were you. The terpost olds it is corn, and it wen't do. There might be conscioud out, and it wen't do. There might be consistent in the partial berspie of it is ear control in. It he can, he can do may be a survival of the yell georgeological. Moring has weeked at it.

a great deal, and so have the Preschairs. The And the state of t

3506 Chew PalACETYLENE GAS. Fed 1 Preparations for General Introduction of the New Huminant.

Acetyleno gas, the now illuminant, a description of which was printed in the Erraing tual use, although matters connected with recprietary interests are still engaging most of prietary interests are still engaging most or the nitention of the men who have it in charge. The parent company, which has the rights for acceptance gas, as made from calcio carbide by the new process, has disposed of all of the rights throughout the country except in a few states, and with the general exception of the lighting privileges for rallsay cars. One company has secured the anticipa-tory rights for the "Greater New York." It will productly be next winter before the gene-ral public here will get any of the udvantages of the new method of lighting.

in 1 missiothnia, nowever, the company has been emicker in geiting to work. For some time it has been preparing a plant at Niagara Falls for the manufacture of the carbide, and It is expected that the electric furnice where It is made will be in weeking order to-day.

Already the company has put in a bid for street lighting, and within a few weeks will light a full square with acotylene-gas lamps. The lumps will be used in the upper part of Brond Street, and an effort will be made to show that the gas gives as much illumination as electric are light, and is cheaper and more cusily handled. The experiments in public in this city have been confined to a few cars on the Third Avenue cable line about two months ago; no passengers were carried on the curs, and they were taken off as the experiment true shown to be successful.

ment was shown to be successful.

In most of the cities where the rights have
been secured the gas companies have been the
purchasers, and it is probable that the first use
they will make of the new gas will be as an
enricher of water gas, in the place of naphthe Du major the acciplana the percipitation tim. By using the occipion the precipitation in the pipes, it is asserted, will be prevented. The gas also is obespec than amphibs. It is impossible that the companies will abundon the use of the water gas, in spite of the fact that accipient gas can be made more changing and gives a better light, until they are forced to do so by the wearing out of mains or the opening of new districts, in which cases they will probably by no more mains, but will supply houses with liquided gas.

The chances are, therefore, that the country

districts will be the first to benefit by the new illuminant, as was the case with electric lights which were not often substituted for one untithe old plant was seen out. The adoption of the system of supplying the liquefied gas to private consumers will probably be the first application of the neetyiene in this city, although it may be that some street-care will use it carry next fall. The company here is already experimenting with steel flasks, which are to be eight inches long and four inches it dismeter, and will contain one pound of H-quefied gas that will last for fifteen hours. The amount of light given by the one-foot burner is calculated to be equal to the amount give in burning forty feet of twenty-candle power of ordinary water gas.

The cylinders can be placed in a regular

innon-stand as in the kerosene-oil reservolr. For use in houses, tanks of the liquefiel gas may be attached to the gas-pipes now in use, or a block of houses may be supplied by central plant in the middle of the block, as but little recen is needed for the purpose. Lamps in outlying districts can be made to use the gas by making recen on the post for a crilinder of the liquefled gas to be replaced when county, in the same way as in lamps for house.

It is well known that the cost of the neety-

lene is much less than that of water gas, but until it is made on a large scale the cost to consumers cannot be told. At present all of the carbide made is in North Carolina, whose it has been shirted all ores, the world for experiment. At the new furnece at Niegara it is thought that the cost of the carbide will not be more than \$20 per ton. The expense not be more than \$50 per ten. The expense of liquefying and delivering the \$50 pounds of gan which can be made from one ten of car-bide in \$7, making the cest of fifteen cube feet of the gas about four cents. This will give about fifty-candle gover for fifteen hours.

about fitty-anothe power for fifteen hours.

Many advantages set enthanced for earlytime are investigated and the rays are nested to provide the control of the control of

"LIGHT'S EFFECT 350/ ON VEGETATION.

Herai - Tel 9 Experiments Made at Juvisy on the Action of the Various Rays on Plants. 1896

RED INCREASES GRÓWTH. Development of Growing Plants Entirely Stopped When Exposed to-Blue Light.

COMPARISON OF THE COLORS.

From the European

(From the European Edition of the Harald ) E have undertaken, at Juvisy, the study of the various rays of the solar spectrum. A. Violle's registering actinometer, with conju-gated thermometers, a vapor actinometer, a Crooke radiometer, a

registerer of the hours of sunshine, and several series of colored ermometers are in constant use and render it possible to calculate the caloric received according to the season, the hour of the day, the state of the atmosphere, &c. The object of these observations is to ascertain if there is not some relation in our atmosphere and in the complex question of climate between the calorie received from the sun and the state of that luminary. In the course of these studies we thought

it interesting to investigate the peculiar actron of the union vegetation, where is a transformation of the solar energy. Which are the rays of the spectrum which act meet effectiously? It is possible to distinguish the luminous rays from the calorific rays and the chemical rays, to seek the characteristics which distinguish the slow radiations of the red end of the spectrum from the rapid ra-diations of the violat end, and to assertain which are those that exercise the most favorable influence upon certain phenomena o egetable life.

wegetable life.

Where colours glass.

With this object we constructed glass frames with glasses which had been carefully examined with the spectroscope. It proved impossible to find perfect violet proved impossible to find perfect visions glasses, though twenty-two specimens were examined, for all allowed the passage of red, yellow or green rays. We wore, however, able to obtain blue glassess very near to violet, which only allowed the passage of the rays from the right extremity of the spectrum. The red glasses are almost mone

SABLE TRIMMED SKATING COSTUME BY BOUCET. chromatic and only allow a little orange to

chromatic and only allow a little orange to pass. The green are less satisfactory.

We thus constructed, side by side and in the same meteorological conditions, three frames—red, green and blue—to which we added on a transparent white glass to emble us to compare the offects of full sunlight. In order to render the conditions as natura in order to render the conditions as natural as possible and avoid too high a temperature the frames are ventilated by a current of air passing from seath to north, but the light from south to north, but the light from south cannot enter the cobered frames, even by reflection.

Among the many reality which we deviate the customer of the customer of the various which we made on sensitive plants, which were chosen as subjects of experiment on account of their extraordinary seems.

Three acceptable places, all agenced on the measure of the places of the

Opport Warn, and M. All Service of the Company of t

in the name order in much greater promets back in a manurer account of the facts of the property of the proper

"We desire, for grown in being, red, green, while, being red, green and generally and the second of the second of

Felanmiario MR, EDISON'S LATEST

A Favored Few Treated to an Exhibition of the Inventor's Most. Recent Production.

CALLS IT THE VITASCOPE.

Spectators Witness a Skirt Dance and a Derby Race with Life Size Figures. Afte 4. THE KINETOSCOPE PERFECTED.

What Will Be Possible When the Machine is Connected with an Improved Phonograph.

A new Invention by Thomas A. Edition was shown to a few favored persons at the West Grange laboratery last alght. The saw matchine is really a grown up kinetic rease, and it is a success.

Mr. Edition coils his latest invention the Visacope, which he says means a machine showing life, and that is executy what the

Visionov, which he says means a months of the process of the control with the control with

last summer. The filts real on which the plac-tographs were attached was arrained over it half dozen spools and pulleys, and the ma-chine was set in motion.

Even the investor himself was surprised at the result, atthough with his usual crit-ical eye he discovered flaws in the tilm which

Ind eye he discovered fawls in the tilm which in deplared must be disposed on before the vitascope would come up to his ideal.

In the discovered was a supplied to the discovered was the discovered was the discovered with the pictures as they appeared on the acreem, and which had been the hardest obtained to make the discovered was the discovered on the acreem, and which had been the hardest obtained to make the discovered was the discovered on the acreem, and which had been the hardest obtained to make the discovered was the discovered on the acreem, and MANNEY SIX BENDRED TIMES.

The original photographs as by the kineto-copus and developed on the film roll are about the size of a special delivery postage stamp, and to produce nife size picture they are magnified about six hundred times. Or course each vibration of the film or the ap-paratus which reveives it is magnified in like proporties, and every previous attempt to do may with this vibration had been unsuccess.

Mr. Editon expects to be able soon to im-Mr. Editon expects to be able soon to lam-prove the phonograph so he will be able to take records double the length of these which the present cylinders will contain, and the vitancepe and phonograph will then be so combined that it will be possible for an audience to watch a photographic reproduc-tion of a grand opera and hear the singers and see the acting with as much distinctives of sound and vision as if they were in the opera house.

Recorded Volume of Sound Will Be Magnified so Each Actor's Speech Will Selected Hay 1896 3509 DETAIL OF THE MECHANISM.

DISON'S vitancope, the latest thing on the vanded wile stein, and a triumph of the Wizard's inventive grains, is a rimple, in a rimple of the wile and the wile and the wile will be the w

emored life, and he added that it was me or the control of the control of the control of the selection of the control of the sine-steeped with which he had serve them anticated, which will be all serve the control of the control of all men, women and anticate and across runs of men, women and anticate and across runs of the control of the control of the control of the server to the spectrum and anticate, moving monograms. The result is interestly interest, and the control of the control of the control of the server that the control of the control of the across the control of the section of the control of the control of the section of the control of the control of the section of the control of the section and heart to see the movements of the actors and hear to see the movements of the actions and hear their voices as plainly as though they were witnessing the original pectuation itself. And when it is remembered what married Edition into produced, it, would not seem at all improbable that he may be tadd that one to his minary others.

THE VITAMOPIE DESCRIPTION.

THE VITAMOPIE DESCRIPTION.

The National Process of the Control of the Control

seeing the stay they have purposed in the contract of the cont

-----

TESLA'S EVERY DAY VIEWS. PLACE THINGS.

Are About the Manufacture of Jackstage in Strenks a Mits Linux-Work, Nices, Pity time, and Marriage-Steep the Great et al 1 Life Protoncure. One night at about 11 o'clock I found Mr. Tasks in the cotid, sented at his usual table, best-ing tired and hargand. Hog receded me with the kindly smite and streng grasp of the head that are autural to his, let I saw by the salities.

d his face and the dark eyes that something

of his fare and the dark eyes that senothing had gene wread.

"I am afraid," he said, "you won't find me a pleasant composite to-sight. The fact is I was almost killed to-day,"

"You." he continued, "I get a shock of about three and a helf million woits from one of my matrines. The spark jumped three for the supply the day of the spark jumped three for the shoulder. I rell up we it made are feed ittery. If a shock of about the supply the old and struck me here on the right shoulder. I rell up we it made an feed ittery. If shealise, I tell you it mede me feet dirry. If my assistent had not trented fit oursent his stamily it might have been the end of me. As it was, I have been the end of me. As it was, I have to show for it is queen mark on my right heart, where the current strenk in and a hearest heel in one of my rooks where it left in body. Of course, the volume of current was exceedingly small, otherwise it must have been faind. Ven know three and a half million wolfs to no jets, however small the volume." A great difficulty, and at the same time a de light in talking with Topic, is the orter inability one feels to understand what he is saying, or lift con's soil to the planes on which he is think-ing. What crilinary person could grapple with the idea of three and a hell million velts or the electric contrivances necessary to produce 17 lance prefettly well that 20,000 voles is the potential considered absolutely fatal in the our-neal used for execution, and yot here was a ram, perhaps the greatest electrician of his time, calmly describing his sensations in receiving the sheek of a current more than 150 times as strong. It was plainly hopoless to attempt any understanding of this accumity, so I asked about

uncerstanding of this accumity, so I asked about semething casier.
"I should have thought the spark from such a current would jump forther than three feet,"

"50 it would if I had wanted it in higher frequently had quarks from my high-tensitian machine james the width or length of my lab-tensitian particles james the width or length of my lab-tensitian particles in the label of the label particles in the label particles in the label particles in the label particles would be no particles difficulty in the quark. In the label particles would be no particles difficulty in the particles in the label particles would be no particles when the particles in the label particles when the label particles in the would cost so much, either."

I soked Mr. Teele if he had had many acci-

would not notice, allowing the system is not as the control of the

"They be probable at the control of the control of

PROF, LANGLEY'S AIR SHIP. Jan in soiven tun rubnien or ABRIAL SAFIGATIONS

ABILIA SAIPTATIONY

LIS RECEIVE NUMBER For by Altraceller,
Orsinne Britz-betails of the Machine,
Drittaguidelte Furvator and Risk Works,
Drittaguidelte Furvator and Risk Works,
It is Press the AL Lenis Guide Concent.

In the Fort S. F. Langley of the Southsounds Breititation had desinitely releved the
more that Fort S. F. Langley of the Southsounds Breititation had desinitely releved the
more attention than is line. Committee from reach
more attention than is line.
Committee from reach
more attention than is line.
Committee from reach
more attention to a characteric formina field,
in the committee of the co a mas of release so Aktanador Grabana Boll, its was not such as monomercens at an might have come from rome unknown fractures.

Prof. Landry would blue a framework me the prof. pro sevent in your search in readow would from overteen errord parts and extractive readow search
for errord parts and extractive readow search
for extractive readow

II was a printly remarkable think that a mon-bility from making a large state of the con-lution a front making a large state of the con-lution and the control of the con-munication at his two and Microson is beared and he old that takes up with his invaridanties of the control of the control of the con-struction of the control of the con-trol of

nying machines have been built, and his inven-tion represents a clear triumph for pure indus-tive coloner. When Stephenson built his locatorities be proceeded in his work upon certain definitely known facta-that is, he was perfectly sere-that if he could find a way to guah his wheels

The state of the s

3512 SELF-PROPELLING BIKES.

OBSTACLES WHICH REMAIN TO BE OFERCOME BY INFERTORS. The Withing of the Motors the Green, Blistand Zieterstrip – Attenues to Motors
and Zieterstrip – Attenues to Motor
and Zieterstrip – Attenues to Motor
and Attenues – Attenues to Motor
and Attenues – Attenues to Motor
and has addressed such attenues of deviate
and has addressed such attenues developancial have been binessensia, concess down
desired such attenues developancial have been binessensia, concess down
desired such attenues and concess down
desired such attenues and concess down
desired such deviates and concess down
desired such desired such desired
desired such desired such desired
desired such whether this irea or sections were imper-upon the motives that induce the majority of people to ride. Those who use the wheat for the beneficial effects of the exercise will certainly not look with much favor on a device that will render muscular effect, unnecessary.

although those, as well as those who rate pus-ir for pleasure, weath no doubt regard as desira-ble any innovations that would onable the rider to do his own potalling or utilize the power of the meeblast will. Those who use kircless as a matter of business geliotically, that is, to save our rise, would undoubtody had with delight a self-populing wheet, providing it could be op-sented with sufficient consour. With the last

June / 1996

ter class of theirs the cent of the motion aware trace and the cent of the motion aware traces as well as the cent of the cent

has been very limited, and their effects appropriately the interpretate the post of post of the post o as the majority would be able to handle with-out moties acretion. Taking this as the highest weight allowable in a self-propelling blorde, it will be soon that there would be only fifteen nounds to cover the weight of motive power mechanism, and also the additional attenuthening that the various

parts of the appraximate would resulten. Now to determine what amount of yours would be to determine what amount of yours would be required to propose the water. If this average weight of rifer and when would be 100 pumple, this can an average most not profession 100 pumple. This can an average most not found in 100 pumple, this can an average most not that the resistance of the pumple of th



horse your. On a smooth supairies, pava-quited, as then held this power would be re-quited. As electric or a gas into or of this ca-pacity can be made that will work consider to the control of the control of the con-cept flat on the weight of the work made to parts. But to the weight of the work made or which the residence of the work made of which the residence is transmitted to the weight also the weight of or one and that the second taker is the case of or electric motor.

The second secon

American and the second of the

35 12

THE MARPLELOUS NEW APOLITY

That Preservice Meay Solide, Assistant Them
Abstration as of This Work Glasse.

Abstration as a proper description of It, which It is a proper description of It is a proper description to be photographed in a variety of coverings. It has been accretained that the light from Crook's tube penetrate, not copy organic matter, businlooses smont, abundous. Prof. Routers has sent rays of the new cleanical light through aluminum plates an inch lidelt, and they wenter clean through as if the substance had been ginus. The rame was the case with two sets of books, including many volumes, these he placed between a Crooke's tube and an entitary compass. Behind them was a wooden case with dry plate, and the result was as complete a phopinto, and the result was as complete a photo-graph of the compass as is presible.

It is perhaps no photograph in the ordinary sense, because no lenses are used. It is not a negative, but a positive plate that is obtained.

3514 JANUARY 19, 1896-COPYR THE NEW PHOTOGRAPHY.

FURTHER MARYELS OF PROF. BOUTGEN'S GREAT DISCOVERY. 

of Objects on a Photograph Plate Is Not Light, Whatever It In-A Successful Exhibition of It in London-Merelless Lam. popular of the New Port Laurente-Man-Birdie Sutherland Wants \$100,000 for Her Blighted Affections-The Earl of Lonsdale's Overstrained Nerves Get Him Into Trouble-The Buke of York's Little Bon to Be Christened St. Felly. Special Cable Dematel to Tax fore

abile with Crouters take and the way, and had a many indicated with Crouters take a selection of a brief many house, and the many house of the pure control of the pur

3515 "DAILY TRIBUNE, SUNDAY. . .

MARVELLOUS DISCOVERIES.

NEW KINDS OF PHOTOGRAPHY PICTURING YOUR BONES AND NOT YOUR

FLESH

BUBSTANCES OPAQUE TO LIGHT AND ELECTRICITY PENETRATED BY A MYSTERIOUS AGENT THAT APPECTS A SENSITIVE PLATE,

THAN AFFECTION A RESERVING PLANE.

The woodford assumed as a made a for a personal control of the property of the first of the finite is ordain a few property of the finite in ordain and the property of the nla, in what proportion it is too soon, perhans.

say. Late in 1933 (at first in September, and sever Late in 183 (at 1125 in September, and sever times thereafter), a photograph dis citalned; Palo Alto in the following mannet; A silver ha-dollar was laid down on an ordinary photograph



der-polits, with a thick sheet of mice interposed. A control of the control of th dry-plate, with a thin sheet of mice interposed a



coll.

The second of the control of

an energy to an every security of the control of the process of the control of th

3516

NEW LIGHT AND SURGERY.

OPERISTING ROOMS.

OPERISTING ROOMS.

New York's Best Surgrous to Bonbi as to
the Exact Yalus of the Light is Their
Work-It Has Great Possibilities.
What it May Be for Madisal Practice, Works-II. May Great. Foundations with the prediction of the predic able anybody to say exactly what are its peed

bilities.
"The new light, according to all that has "The new light, accepting to all this, has been subded to kind consurgers, then acceptance to the country," read non surgers, "makes possible the photographing of the human skeleton, and that is all. For instance, the human skeleton, and that is all. For instance, the human skeleton and the same than the human skeleton representation, the most promise in the hard here represents on the property of either on the picture. It was as if all the flesh hand here removed and the lare askeleton of the hand held my to the cumers and resproduced. It will be seen that this could be of slights after the will be seen that this could be of slights after the state of the same properties. It will be seen that this could be of night advantage to a surgiou. Everything that can be known. Be spiriter could be it asymbia store the homes frame is Rosem. Be spiriter could be asymbian store in the surgious store the surgious store that the surgious store is not the surgious than spiriters payly for telling it to the surgious. It has been said that it would photograph the skull, but the rays do not penetrate begreat the best best printer the bone itself.

Supposition beases there pictures the some most "his peace of the High I false seed as," "he made it is the High I false seed as, "and the his peace of the High I false seed as the resident of the high I false seed as the resident of the re and stop.
"By means of this light, I have read we

A second section of an inflational has per son of grade and the control of the co services of the control of the contr

The second secon

3517 THE WONDERFUL LIGHT,

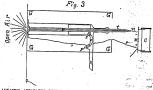
WHAT LIGHT IS ACCORDING TO THE
LAM MODERS THEORY.

Farming's Beginnings—Maxwell's Great
Trentise—The Brillian's Discoveries of
Rivers—The Observed Facts and the
Hypotheses in Rountien Discoveries, Hypotheses in Rocation Biscoveries, The strange phetographic offects which Run-igen has discovered being the public again fare to face with the modern theory, the electro-magnetic theory, of light, a theory of which Forsday was the prophot, Clerk Maxwell the framer, and Hertz the demonstrator, framer, and Hertz the demonstrator. The wave theory of light was established early in this century by Young and Frennel, This throry declares that all space through which lights travels is filled with a modium, to which the name leminiference selven, or simply ether, is given, and that light passes through this modium to means of transverse waves; that is, waves of such a character that the motion of the particles of the exbert transmitting the of the particles of the other transmitting light is everywhere at right angles the direction in which the light is tray-li



This figure gives a rade representation of the idea. The dots on the straight horizontal line represent particles of the other which are in their natural unlitturbed condition. The dots their natural undisturbed condition. The dots on the black curved line represent the same particles at a certain featant which region of same, in that is made in the first a wave of their region of same, in stant later the same particles will be in the particle by the heavy dots on the other curved line. The particles merely more hash sand forthen the dotted vertical lines, as the

and forth on the dottod vertical lines, as the associative avera pass them. Before the time of Faraday the attractions and republicas of magnetized and electrified bodies were well known, but Faraday under-took to exalian these officies by means of a medium which he believed to fill all space where magnetic and electric nettons occur. He showed by experiment, that the ettractions and repulsions in question are at least affected by

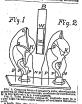


LENARD'S APPARATUS SHOWING THE PASSAGE OF KATHODE RAYS FROM A VACUUM TUBE TO THE OPEN AIR THROUGH A SHEET OF ALUMINIUM.

Prom B'reforman's Amasten for January, 1835.

It is an industrian cell, aboven on a results seeks then the rest of the apparatus.

It is a first seming from the section point page to the upper setting plant such of to the latibode, K, a disk We as a principle from the registre point of the earth through the small (this table to the patients, it, were the patients of the earth through the wall of the 'pile to the contribution of the earth through the wall of the 'pile to the through the pile to the patients of the earth through through the earth through the earth through through through the earth through the earth through vented and mole much use of the term. "Bless of force," now as familiar in electrical reference in the way as familiar in electrical reference in the way as the further and early entered the fine of an electromagnetic medium with the idea, already familiar medium with the idea, already familiar for the function of the state of the function of a vaccum [a vaccum far and the state of the function of a vaccum far vaccum far and vaccum far a



very light taxons under aways of excitory fixed in a very light taxons under aways of excitory fixed. A both list that right-leads day was made by Four-er and taxons to the state of the

investination.

In bito, the electro-marinatio medium) to the magnetic fove, and the general character of manageric functions to termal to the magnetic function of the strength of the magnetic function of the strength of t and many solventies on the presence that the attention of the presence of the

shortesting by mean of production stellar shortesting by mean of production stellar shortest absorbesting of a such as conveying the special posterior of a such as sometimes of a such as such as

di marin di seriasi

And there are using reals, shall at possite them statements in which March and the statements in which March and the statements are the statements statements ar

manuels theory of high.

The other wars known before the filtereration
of Herit were as short as to be incurred in
of Herit were as short as to be incurred in
immediate the second of the filter theory of
minded the second of the filter theory of
minded the second of the filter theory
manuels calcust direct second of their incurred
meanuels calcust the second of their incurred
distovered were smarp feet in length. They
were predicted by electrical means, and they
were predicted by electrical means, and they
were predicted by electrical means, and they
were predicted. They were undended
when the second of the second of the second of the second of
high collapse plant ware, and they travallike or they have were and they travalmany light second flows. These cold be an

goods that the time kinds of wares were the control of the same. To put the matter lists are the same. To put the matter lists are the control of the crush not street, yet and yet are perfectioned that part, we may my fast the part lists are the crush not part, we may find the back and forth accrus the said of the light in Pic. I are particles of electricity. Ferning in Pic. I are particles of electricity. Ferning in Pic. I are particles of electricity, ferning the control of the c

and the story of light. No attents will have be positive to the positive to th

history; moscul, hypotheses as to the nation; of facts expense to be in the control of the contr

menter.
(c) That the "rays" are not affected for the

magnet.
The hypotheses are:

The hypotheses are;

a) That the "raps" are prosugated by vibrations of greater length than those of ordinary
light. Against this hypothesis we must put the
expectment of Mr. Steinten, jest aliaded to.
to That the "raps" are sailed such merely beclosed the product of the steint of the steint of the
culturary before the processing the preference of the steint of the steint of the
steint process are refracted to see than the videot rays, which are themselves the most refrangi-ble rays of the visible spectrum. As the Ringpen "raya" are apparently not refracted at all, it is difficult to see how they can be ultra-violet

is a difficult to see how they can be ultra-violat.

That they are sport Intentional at these of the control of thing about the behavior of such vibrations, and there access to be no reason whiterer why "rays" propagated by such vibrations should not pees with great readiness through piece. But the Reatgen "rays" act through ordinary glass with great difficulty, and it is very should be the weather than the property of the pro longitudinal vibrations.

May we not, then, sak whether the lifetion

May we not, then, not weather the Undagen clicic passes through word, of field, or any other oponies material, into form of rays at the copuse material, into form of rays at grack, but they appears to have much in com-nous, and the figure given by Leenard, here re-positored, shows the little "slocker" of alami-tic pays as glass would transmit light, but taker reducting, as if itself the source of the vibrations preceding from it. Now this is the kind of effect we ob-lain by fluorescence, who a transium glass, for instance, excited by ultra-viside rays, gives of the control and it is only one of many substances doing the arms kinds thing. Is it use passible that the Hönigen effect is a fluorescent effect, to which wood and field and cettain other against subword and fieth and certain other company authorizes are peculiarly surregularly. If this surraise should prove to be true, distinct, sharply outlined effects upon the plategraphic plate are not to be hoped fet; unders the unsareptible body, the interproad bit of gins, for instance, is close to the plate. This suggestion as to the thousement character of the Ribottern effect is given here on a suggestion mercity. If Pec. Nexues or Venna has insented calcarons. deposits in the organs of a living body by the deposits in the organs of a living body by the Binging process, the fluorescence hypothesis here advanced it scalindy unionable. The report any, however, the organs of "smilpter," which probably means a dead and dissected body. It was the good fortune of the wriger to which ness, aday or two are, the first theroughly suc-cession attempts made by Prof. Trovidice of liarrant with the new photography. One of liarrant with the new photography. One of

Harrand with the new photography. One of the flarrer included here is a far-shaile of the Crookes tubs, or bulk, which he need on that occasion. It is now of the theory for the pro-cession is now of the theory for the pro-tessed of the problem of the pro-posable interest to the yolds, as indicating stops of the remarkable Statements long since observed in Grookes tubes. CARESHOPE, Jan. 31. EDWIN II. HALL.

3518 CATHODE PHOTOGRAPHY.

POLLOWING UP ROENTGEN'S STARTLING

the delight formed that it is immersive to the second of the contract of the c wemen me discussion the facts that the first experience of the process of the pro

rather satisfactory results last week. In one of his tests he placed small spheres of platinum, brass and aluminum in a paper box, packing the ity of London investigators to push their exmetal in cotton. He aimed his Crookes tube end-wise at the box and placed behind the latter a tists have done thus for. But the delay has metal in contan. He aimed the Goubes tube end-ployed production of the content of the content of the content of the photographic plate in the content of the content of the content of the production of the content of the sweets between the content of the conten permits the passage of ordinary light so freely obstructs the cathode ray enough to cast a fain shadow. It is apparently, more opaque that

wood or the aboutte wilder used to cover a sensi tive plate in a photographer's plate-holder. Pro-fessor Trowbridge, of the Jefferson Physical Laboratory, a Harvard institution, has had a share in developing this latter fact. EXPLORING THE HUMAN BODY.

POLLOWING UP ROENTCERNS STATEMAND DISCOVERIUS. If possess the most assistant for the popular content f

could take off his firsh and sit in his bones, but which the some of the same take a magnitude of discredited the lifen that the "new light" would shadow on the plate than the firsh. But Producinglet a living person in that siry costume. If fessor Wright is reported as finding a much lywas foldingly suggested that if this instrument less striking contrast. The Wurtwarger's cane.

CROOKES TUBES HARD TO GET. Some surprise has been expressed at the abilMR. TESLA'S EXPERIMENTS.

Since the first surprising news of Röntgen's work was received in this city, Nikola Tesla, the distinguished electrical export, has been repeat-edly asked to talk on the subject for publication. ENGINITED IN DELIVERATION STATEMENT OF THE STATEMENT OF T

eration funitions the about plots prepare HITHERTO PRODUCED-THE CATHODE RAY-

leaged across the long gap, and departed by the segative wire. Even when the contents of the tub is were almost entirely exhausted the peculiar an heautifully stratified radiance obtained proceeds. chiefly from the "anode," or positive, terminal.

But with a still higher vacuum a new radiance resulted, and this emanated from the negative ter minal, or cathode. The cathode rays were percepti ble sometimes when the other kind of illumination was visible; but it was possible to get rid of ligh



from the anode entirely, and thus render possible a more claborate scrutiny of the effects produced by the negative pole. It might be remarked, in passing, that the current employed in such experi-ments was not taken direct from a frictional ma-

ments was not taken direct from a frictional met-thine, a givanic battery ner, a dynamo, but, what-ever the source, the electricity was first sent through on induction coll, and the secondary circuit of the latter was connected to the tube. This enabled the sparks to leap a much greater distance than would otherwise he possible. William Crookes was one of the most active investigators of the properties of the cathodo rays, and therefore the tube in which high vacuum experiments were conducted was named.

The first effect which was noticed was a faint phosphoreacent glow in the interfer of the tube when the current was sent through it. Crookes proved that this came from the cathods and that it was caused by straight rays by introducing a Malitse cross into the tube so, that it would cast a shadow. It also found, on arrunging a selicate possiliewheel in the tube in a suitable possilien, that this object would rotate, as if impelled by a force emitted by the cathede. This fact, taken, with some others, led him to believe that molecules of the

were snot away from the negative electrode with



MINISTANCIAL ESPIRET, OF THE TAXY.

MINISTANCIAL SEPTIME, OF THE STATE AND ADDRESS OF THE STATE ADDRESS OF THE STATE AND ADDRESS OF THE STATE ADD MECHANICAL EFFECT. OF THE RAYS.

therebed some rays that will pass through alum freely. Todine is now known to be a fluorescent sub-Senting of the control of the contro

THE NEW PHOTOGRAPHY.

ARMY AND NAVY OFFICIALS PREDICT VALUABLE REQUITS PROM ITS USE IN TREEN WORKS.
Washington, Pab. 1.—Army and Navy ordname.
Washington, Pab. 1.—Army and Navy ordname.
unitals are deeply interested in the wonderful
minister of the state of the s RESULTS PROM ITS USE IN TSPEER WORK. impeachable evidence as to the efficiency of vari-

series stated accept from the augustive electrical scale grant velocity, and extend plan strains assume management of the property velocity, and extend plan strains, assume that state demands applications of the property velocity, and the state of demands applications of the property of the control to the

3519

PHOTOGRAPHING

Experiments by Professor Wright, of Vale University, Confirm Professor Ruentgen's

Herai Discoveries. 2/896 HIDDEN OBJECTS PORTRAYED

Pictures of Coins in Pocketbooks, the Lead in a Pencil and Flaws in Metals.

SHOWN BY THE CATHODE LIGHT.

How This Latest of the Miracles of Science Will Be Made of Great Practical Value,

IMPORTANT AID TO SURGERY

Character of the Process Employed by Which the Barriers of the Opaque Are Overcome.

Professor A. W. Wright, of Yale Universi-Professor A. W. Wright, of Yale University, who is in charge of Scane Laboratory, who is in charge of Scane Laboratory and professor of urgan and professor of urgan and professor of urgan and the contact striking manner the corrections of the professor flooring, dermany, dependent of the professor flooring, dermany, despite the photographing objects behind opaque in photographing objects behind opaque. Professor Roessiem of Wurzburg, Germany, in photographing objects behind enquest bodies by the use of cothode mys—in other bodies by the use of cothode mys—in other bodies by the use of cothode mys—in other bodies, and the cothode of the cothode mys—in other bodies, and the cothode mys—in other bodies of the cothode mys—in other bodies of the cothode mys—in other bodies of these photographs he has myda—fosses of these photographs he rewith reproductions of the photographs herewith reproductions of the photographs herewith reproductions of the photographs herewith reproductions of the photographs In making the photographs of invisible objects a highly sensitized plate is placed in an ordinary photographic plate holder. Hight in front of it is placed the object to be photographic. It is the case that the object is to be proposed. It is the case that the plate that it is the case that to graphed. In the case illustrated it was an ordinary lead geneti, and lele purpose was to photograph the lead in the penell. That the experiment was a success, is evidenced by the accompanying illustration, in which the lead is clearly above, the neconjunging illustration, in which the lead is clearly shown, the wood surrounding it being but faintly visit, wood surrounding it. Next to the object to be photographed in 1800, Vacuum tube, technically there is a name of the tube the control of the tube tie, cuttode or separative piece of the tube tie, cuttode or separative piece of



cathode mys are obtained. These rays op-erate with treat energy mean a smalltwe photographic plane, and produce effects even when a their layer and produce effects even when a their layer and most or spaced to the photographic plane. The photographic lectures the tube and the photographic plate.

-C PROTOGRAPH OF THE LEAD IN A PENCIL.

PHOTOCHARM OF THE LEAD IS A PROCESS.

specied that the over of parameters of allgranted that the over of parameters of allprocess of the parameters of t

HOW THE LEAD IN THE PENCIL WAS PROTOGRÁPHED.

Des des dereits of Jahren have Jose Vernieren der Gescheits der Jahren have Jose Vernieren der Gescheitstellung der Jahren der Gescheitstellung der Jahren der Gescheitstellung der Jahren spatic distinctly. Another interesting experiment was the following:—
The becturer tool at how, the obles of which were held tools of the beat of the most held tools of the house held tools of the house held to the house held to the house held a what chant, and then exposed the whole to the cathodre axis, the house he make chant, and then exposed the whole to the cathodre axis, the house held and then exposed the whole to the cathodre axis, the house held of the cathodre axis, the whole house he had a trace of the wood. Another abspleading he a hand showed charify a brothen bout in one of the wood.

THE BURNISC TREE OF BURNAH.
There has lately been added to the collection of plants at the Betants Gardens at Madras, India, a specimen of a strange tree. It is in size scarcely more than a bush, but others of its species are known to have at-tained, in their habitat in the Himalayas, Street, and the Milleren Parts District Parts Conference of August 2000, and first transmission of August 2000, and first Burnesh, and the Malocca Peninsula, the diof the lingers. Yery interesting also was the reproduction of a phetograph of a large metal plate. It appeared that the plate lind in tegether, and no smoothed over that one saw mothing of the joins. The cathod rays because the freetre to light unite distinctly Wedde not those cathod enys segril in Fould not these cuthous rays or toking for flaws in our armse plat. The lecturer warmed his nutlen remature optimizm, touching the unplayment of Professor Reenings. The nevertheless said that h



COINS IN A POCKETBOOK PHOTOGRAPHED results obtained demonstrated that they may yet become most valuable asis in modern surger. There were two patients on when operations were to be performed. The plus tographic pictures taken showed with the

3521 BRUARY 3, 1806.-FOURTH

## WITH CATHODE RAYS

Professor Trowbridge's Experiments in the Line of Professor Roentgen's Discoveries.

#### SEEKING SHARP SHADOWS

He Relieves That in Time the Organs of the Body Will Be Plainly Photographed.

DO NOT ALWAYS ACT THE SAME.

Something About the Rays Which Still Remains To Be Discovered by Scientists.

(BY TELEGRAPH TO THE HERALD.) for FILEGRAPH TO THE HERIAD.]

DISTON, MISSE, PED. 2 308.—Bo great is the
pulse interest in the experiments that after

festor Trowbridge, directory of Profestor Trowbridge, directory of Harvard College,
that he has found it necessary to deep himself to many cullers.

Frofestor Trowbridge has been for several

Professor Trowbridge has been for several pears working on Exast saiding to these feature pears working on Exast said in the host pears working on the said of the said of the said of the said of the collectical laboratory. It is said in the collect that pears were pears to the said of the top the said of rector in the country.

He thinks that by the employment of ura-

He thinks that Ur the employment of turnpiles intended of that for the twine, for semsitinfactory retains will be relabed, and has
districtory retains will be related by the
thinks of the thinks of the thinks of the
thinks of the thinks of the thinks of the
table of the thinks of the thinks of the
transference of the thinks of the thinks of
the thinks of the thinks of the
thinks of the thinks of the
thinks of the thinks of the
thinks of the thinks of the
thinks of the thinks of the
thinks of the
thinks of the think of the
thinks of the
thinks

sonstitute phate, but it was irregular and not distinct.

Ile hopes to demonstrate the presence or element of violet in ordinary light, as if by a curious sympathetic effects and the curious sympathetic content of the curious sympathetic effects and the curious sympathetic effects

in or refracting the may whereby the forement.

Frederic Trovinsion of the man of the total forement of the man of the ma ing or refracting the rays whereby

see that we're diment, asserted and the basic for each was the secretary of the secretary o

at log to report in particular that cet at the control of the cont

angles to it. Researches with calespar and quartz

Printing of the control of the contr

The state of Personal Property the gas contained in the delenage appears by the gas contained in the delenage proposers by the most of the delenage process by the contained in the delenage process by the contained to the delenage process by the contained process of the delenage process by the delenag comparing the intensity of the light of my fluores-comparing the intensity of the light of my fluores-oing screen at distances of about 100mm, and 200 they are generated by the cathode rays at the glasmm. from the discharge apparatus, and found in the case of three tests agreeing well with one another

question it is certain that the spot on the wall of the discharge apparatus which fluoresces most decidedly must be regarded as the principal point of the radia tion of the X-rays in all directions. The X-rays thus start from the point at which, according to the re-

not, according to Lenard, be made responsible for the great difference in the "deflectability." I therefore come to the conclusion that the X-rays wall of the discharge apparatus, 13. The excitation does not only take place in

BOUNDIES SHAIOUETTE. Photographed by Mr. A. A. C. Swinton through a piece of black vulcanized fiber .0212 in

hat it varied very nearly inversely as the square of glass, but also in aluminous, as I was able to accerperforations.

The control of the Co I had here does generatively former and the control of the Army from the first and the control of the Army from the first and the control of the Army from the first and the control of the Army from the first and viously mentioned, that the fluoreseing light was to the influence emanating from the wall of the dis-

vior of enthode rays and X-rays consists in the fact that, in spite of many attempts, I have not succeeded, even with very strong magnetic fields, in defleeting X-rays by a number. The number of effection has been up to now a characteristic mark of the the cathode my; it was, indeed, noticed by Hertz and Lenard that there were different kinds of enthode rays "distinguishable from one another by their phosphorescing powers, absorption and magnetic de-faction? but a considerable defaction was nevertheless observed in all cases, and I do not think this ing evidence.

fain with an apparatus closed by a sheet of alumi-

14. The justification of giving the name of "rays" charge apparatus depends partly on the very regular shadows which they form when one interpress more or less transparent holies between the apparatus and say, they are more transparent for X-rays than for the theoreseing seven or photographic plate. Many such shadow-pictures, the formation of which possesses a special charm, I have observed photographieally. For example, I process photographs of the shadow of the profile of the door separating the room in which was the discharge amoratus from the room in which was the photographic plate; also photographs of the shadows of the bones of the hand, of the shadow of a wire wound on a wooden spool, of a weight enclosed in a small box, of a compass in which the magnetic profile is completely surrounded by metal, of a piece of metal the lack of homogeneity

of which was brought out by the X-mys, etc. To show the rectilinear propagation of the X-rays characteristic will be given up without overwhelm-there is a pin-hole photograph, which I was able to take by means of the discharge-apparatus covered

3521 ARY 3, 1896.-FOURTI

## TH CATHODE RAYS. essor Trowbridge's Experi-

onts in the Line of Professor Roentgen's Discoveries.

KING SHARP SHADOWS.

elieves That in Time the Organs of the Body Will Be Plainly Photographed,

OT ALWAYS ACT THE SAME hing About the Rays Which till Remains To Be Discov.

ered by Scientists BY TELEGRAPH TO THE BEHALD. N. Mass., Feb. 2, 1996.—So great is the nicrest in the experiments that are

nide with the cathode rays by Prorowbridge, director of the Jefferson Laboratory of Harvard College, has found it necessary to deny him-nany callers.

nany cullers.

sor Trowhridge has been for several
priking on lines similar to those folpriking on lines similar to make so
y Professor Roentgen. An endless
of work and a large sum of make
the configuration of the of work and a large sum of money on put into the equipment of the laboratory. It is said in the col-Professor Trowbridge is in a much seltion to experiment successfully hade rays than any laboratory diiks that by the employment of ura- I

stend of glass for the tubes, far more story results will be reached, and he sends the use of an aluminum window sube. Uranium gives a greenish yel-

ends the use of an aluminum window-use. Uraham for year greenshy year. Uraham for year greenshy year in ron glass alone. Under year year, year systemen he was most successful, which was not successful, which was not successful, and year year year. It was not successful, to the year year, year, year, year, older turk, year, year

is of the hand were shadow, they clearly defined that all processes exercisely, and if there had been even fracture it would have been posteoos it from the photograph. The processes will conclude experiently in the hope of finding the eathode of the processes of the ray in a place vessel in even the processes of the ray in a place vessel in even was two more of the ray in a place vessel in even was two modes of air pressure, they found on a very small circular, and they have been always the processes of the pro

es to demonstrate the presence or f violet in ordinary light, as if by a remandatel effect an ultra violet or reproduce itself through a brick it has been shown that an eru-patan is greater in this light than

Professor Presentation was absent the open-tion of Previous Augustian to Conventional, if the conventional augustian to Conventional, if the Conventional augustian to Conventional, if the Conventional augustian to Conventional augustian conventional augustian to Conventional augustian to conventional augustian to Conventional augustian during the Conventional augustian to Conventional augustian to conventional augustian augustian to Conventional augustian to the Conventional augustian augustian to Conventional augustian to the Conventional augustian augustian

Heat they and differential from the set the "comment of the set that t

ing or refracting the rays whereby they can

the or reduced between the reduced by the control of the control o

21-22 DISCUSSED BY PHYSICIANS.

What Boston Doctors Think of the Die ery and Possibilities of Photographing by Cathode Rays.

[BY TELEGRAPH TO THE BERALD.]
HOSTON, Mass., Feb. 3, 1894.—Profussor A. E.
Delibear, of Toris College, believes it is chem-ical rather than electrical considerations Distance of Yorks Gallerin, believes in a chain shallow the control of the contro

iso little hold of and discussed in the treat-ber, William T, Councillman, of the Harvard Medical School, confeased that he had not you found enough of interests or importance an investigation by him. He could not see where the practical value came in, "In re-gard to the claims that are made for it," he gard to the claims that are made for it, "he can't see that the profoundly acquired.

Section of the control of the contro

And the second s

SUCCESSFUL EXPERIMENTS IN CATHODS PRO

TORRAFFI MADE IN YALK COLLEGE:

[BY THEOREM'S TO THE HERALA.]

NEW HAVES, Conn., Feb. 3, 1891.—Experiments in cathodo photography at Yale are ntill being carried on. Henry A. Bussetead, one of the instructors in physics in the Shef-

ON A NEW FORM OF RADIATION .

BY PROP. WILHELM KONEAD BÖNTGEN. 1. If we pass the discharge from a large Rülmskorff coil through a Hittorf or a sufficiently exhaustral Lemma, Crookes, or similar apparatus, and cover the tube with a somewhat ele-ely-litting mantle of thin black cardboard, we observe in a completely durkened room that a paper serven washed with barium platino-cyanide lights up brilliantly and thuorescesequally well whether the treated side or the other he turned toward the discharge tube. Fluorescence is still observable 2 moters away from the apparatus. It is easy to convince oneself that the cause of the fluorescence is the discharge apparatus and nothing

2. The most striking feature of this phenomenon is that an influence (.tgrss) capable of exciting brilliant fluorescence is able to pass through the black cardboard cover, which transmits none of the ultra-violet mys of the sun or of the electric are, and one immediately inquires whether other bodies posees this property. It is soon discovered that all budies are transparent to this influence, but in very different degrees. A few examples will suffice. Paper is very transparent; t the fluorescent serven held behind a bound volume of 1,600 pages still lighted up brightly; the printer's ink offered no perreptible obstacle. Fluorescence was also noted behind two packs of cards; a few cards held between apparatus and screen made no percentible difference single sheet of tinfoil is scarcely noticeable; only after several layers have been laid on the top of each other is a shadow clearly visible on the server Thick blocks of wood are also transparent; fir planks flem, to Sean, thick are but very slightly opuque. A film of aluminum about 15mm, thick weakens the effect very considerably, though it does not entirely destroy the fluorescence. Several centimeters of valcanized india-rubber let the mys through.; Glass plates of the same thickness behave in a different way, according us they contain lead (flint glass) or not; the former are much less transporent than the latter. If the hand is held between the discharge tube and the screen, the dark shadow of the hones is visible within the slightly dark shadow of the hand. Water, bisulphide of curbon, and various other liquids behave in this respect as if they were very transparent. I was not able to determine whether water was more temps or than air. Belind plates of copper, silver, lead, gold, platinum, fluorescence is still clearly visible, but only when the plates are not too thick. Platinum 0:2mm, thick is transmerent; silver and copper sheets may be decidedly thicker. Lead 1 Suum thick is as good as opaque, and was on this account, often made not of the wooden red of 20 × 20mm, cross-section, pointed white, with lend paint on one side, behaves in a peculiar manner. When it is interposed between an paratus and serven it has almost no effect when the X-mys go through the red parallel to the pointed side, but it throws a dark shadow if the rays have to traverse the point. Very similar to the metals themselves are their salts, whether solid or in solution. 3. These experimental results and others lead to the conclusion that the transparency of different substances of the same thickness is mainly conditioned by their density; no other property is in

the least comparable with this, The following experiments, however, show that density is not altogether alone in its influence. I ex-perimented on the transparency of nearly the same thickness of glass, aluminum, calespar and quartz. The density of these substances is nearly the same and yet it was quite evident that the spar was de-\* Predictions Communication to the Working Physics Modfard Sevicty. Published by Merces, Stake), of Wars-Ingg, Wale will isnerly also been in English cellisis. † By the "transparency" of a looky I denote the ratio of the belightness of a fine-rowed severe held right heldad the tody in quartion to the brightness of the same accounted regardly the same comiltions, but without the interpreta-ing of the property of the same accounted to the same accounted to English when the lateraction of the same accounted to the same acco tony an use conditions, but without me insertions and the same conditions, but without me insertions and the same conditions and the same conditions are same as a same conditions are same as a same conditions are same as a same conditions are same conditions.

cidedly less transquirent than the other hodies, which were very much like each other in their behavior. I have not observed calespar fluorosce in a manner com parable with plass.

4. With increasing thickness all hodies become less transporent. In order to find a law connecting transparency with thickness, I made some photographic observations, the photographic plate being partly covered with an increasing number of sheets of tinfoil. Photometric pressurements will be undertaken when I am in possession of a suitable photom-

5. Sheets of platinum, lead, zinc and aluminum were rolled until they appeared to be of almost equal transparency. The following table gives the thickmeses in millimeters, the thicknesses relative to the plations sheet, and the density:

Pt. 0.018 Pt. 0.05 Ph. 0.05 Belatice thickness. 21:5 It is to be observed in connection with these figures that although the product of the thickness into the density may be the same, it does not in any way fol-

low that the transparency of the different metals is the same. The transparency increases at a greater rate than this product decreases. 6. The fluorescence of buring-plating-evanide is not the only reorgaizable phenomenon due to X-rays. It may be observed, first of all, that other bodies fluoreree-for example, phosphorus, calcium com

pounds, manium glass, ordinary glass, calespar, rock Of especial interest in many ways is the fact that photographic dry plates show themselves suscentible to X-rays. We are thus in a position to corroborate many phenomena in which mistakes are easy, and I have, whenever possible, controlled each important centar observation on fluorescence by means of photography. Owing to the property possessed by the mys of passing almost without any absorption through thin sheets of wood, paper or tinfoil, we can take the impressions on the photographic plate inside the camera or paper cover whilst in a well-lit room. In former days this property of the ray only showed itself in the necessity under which we lay of not keeping undeveloped plates, wrapped in the usual paper and board, for any length of time, in the vicin-ity of discharge tubes. It is still oven to question whether the chemical effect on the silver salts of photographic plates is exercised directly by the Xmore. It is possible that this effect is due to the fluorescent light which, as mentioned above, may be generated on the glass plate or perhaps on the layer of solutio. "Films" may be used just as well as plass plates.

I have not as yet experimentally proved that the X-rays are able to cause thermal effects, but we may verr well take their existence as pooluble, since it is proved that the fluorescent phenomenon alters the properties of X-rays, and it is certain that all the incident X-rays do not leave the bodies as such.

The retina of the eye is not susceptible to these pays. An eye brought close up to the discharge apparatus perceives nothing, although, according to experiments made, the media contained in the eye are foirly transparent. 7. As soon as I had determined the transparence

of different substances of various thicknesses 1 has tened to ascertain how the X-mys behaved when passed through a prism-whether they were re-fracted or not. Water and carbon disniphide in prisms of about 30 degs, refractive angle showed neither with the fluorescing serces nor with the photographic plate any sign of refraction. For putposes of comparison the refraction of light mys was observed under the same conditions; the refracted anges on the plate were respectively about 10mm, and 20 cm. from the non-refracted one. With an aluminum and a vulcanized-rubber prism of 30 degs, angle I have obtained images on photographic plates to one may perhaps see refraction. But the

matter is very macertain, and even if refraction exist it is so small that the refractive index of the X-ray for the above materials can only be, at the highest, 1.05. Using the fluorescent serven, I was untable to discover any refraction at all in the case of the alominum and the rubber prism.

Researches with prisms of denser metals have

yielded up to now no certain results, on account of the small transparency and consequently lessened intensity of the transmitted my.

In view of this state of things, and the importance of the question whether X-rays are refracted on passing from one medium to another, it is very satisfactory that this question can be attacked in another way than by means of prisus. Finely-posteled sale stances in sufficient thicknesses only allow a very little of the incident light to pass through, and that is dispersed by refraction and reflection. Now, poudered substances are quite as transparent to X-rays as are solid bodies of equal mass. Hence it is proved that refraction and regular reflection do not exist to a noticeable degree. The experiments were carried out with finely-powdered neck-salt, with pulvernlent electrolytic silver, and with the zine possier much used in chemical work. In no case was any difference observed between the transparency of the powdered and solid substance, either when using the fluorescent seven or the photographic plate

It follows from what has been said that the X-rays mot be concentrated by lenses; a large vulcanized rubber and glass lens were without influence. The shadow of a round rod is darker in the middle than at the edge; that of a tube filled with any substance more transporent than the material of the tube is lighter in the middle than at the edge, 8. The question of the reflection of the X-rays is

settled in one's mind by the proceding paragraphs, and no appreciable regular reflection of the rays from the substances experimented with need belooked for. Other investigations, which I will describe here, lead to the same result. Nevertheless an observation must be mentioned which at that sight appears to contradict the above statement. I exposed a photographic plate to the X-rays protested against light rays by black paper, the glass side being directed towards the discharge take. The sensitive layer was nearly covered, star-fashion, with blanks of platinum, lead, zine and aluminum. On develaming the negative it was clearly noticeable that the blackening under the platinum, lead, and especially under the zinc, was greater than in other places, The aluminum had exercised hardly any effect. It appeared, therefore, that the three above-mentioned netals had reflected the mays. Nevertheless, other courses for the greater blacks nine were thinked in and in order to make sure. I made a second experiment and laid a piece of thin aluminum, which is opaque to ultra-violet rays though very transparent to Xrays, between the sensitive layers and the metal blanks. As again much the some result was found a reflection of X-rays by the above-mentioned metals was demonstrated. But if we connect these facts with the observation that powders are quite as transsevent as solid bodies and that numerous budies with rough surfaces are, in regard to the transmission of X-rays, as well as in the experiment just deerribed, the same as polished bodies, one comes to

stated, does not exist, but that the bodies behaved to the X-rays as moddy mediado to light. Again, as I could discover no refraction at the point of passage from one medium to another, it would seem as if the X-rays went through all substances at the same speed, and that in a medium which is everywhere, and in which the material particles are embedded, the particles obstruct the propagation of the X-rays in proportion to the denv of the bodies.

the conclusion that regular reflection, as already

9. Hence it may be that the arrangement of the nurticles in the bodies influence the transporoncy; that, for example, equal thicknesses of calcapa-outd exhibit different transparencies according a

#### ROENTGEN RAYS.

Professor Ruentgen's discovery brings to a close a most interesting chapter in the history of electricity; it is the chapter dealing with electric discharges through rarefied gases. Experiments on electric disclarges through vacua bave for quite a long period now attracted the attention of physicists. Elaborate accounts of these experiments can be found in the naneactions of Jeanned societies throughout the last rentury. A systematic research into the various phenomena accompanying vacuum discharges dates from the time of Familiay. Plucker, Hittorf and coldstein in Germany, and Spottismonde and Crookes in England may be mentioned as the foremost investizators who extended very much what Faraday had reds commenced. Among the numerous, most in teneting, and indeed remarkable results obtained by these investigators, the behavior of the discharge which under certain conditions emanates from the asystice electrode, the so-ralled cathode, was always on-idened us the most remarkable.

Fig. 1 represents a typical form of the vacuum tube capable of showing a strongly developed cathode discharge. At a we have one electrode and at b the other. They consist of platimum disks attached to platinum wires which are scaled in the glass.

Let the electrode a becomeeted to the negative and a to the positive pole of the induction coil A. As the air pressure in the tube is reduced, the color and the general appearance of the discharge continually change character. When the pressure reaches a fraction of a millionth of an atmosphere the intensity of the discharge in the gas itself becomes very much reduced, but in its place appears a strong fluorescence of the glass. This fluor-strace is produced by faint streamers which proceed in straight lines from the negative electrode, as indicated by the straight lines in Fig. 1, from the disk at a toward the terminal c of the tube. The streamers are called the cothody our Professor Crookes of London advanced the theory that the streamers represent a fourth state of matter, which he called radiant matter. According to this theory there is matter moving from the negative there's there is maked about the nation of electric force, and whenever this moving matter strikes the glass it causes it to fluoresee. A radiometer interposed properly in the path of the streamers will be set into rotation. The fact that the thorescing portions of the tube become very hot when the



ion of the coil is powerful seemed to support okes's hypothesis, namely, that there is along the 'h of the enthode mys projected matter moving ab sere bigh velocity.

ther theories concerning these rays were propood, but none of them are entirely free from nerion objections. Recutern's discovery will undably enable us to decide very soon which one among the several existing theories is the correct one. The theory which probably has the most followers on the atment will be mentioned presently.

Cathole mys are deflected by nugnetic force; the direction of the deflection is the same as if each recwere a flexible conductor earrying a current with one of its terminals attached to the eathods. The late Professor H. Bettz disensered in 1891 that

if these shorts are placed within the vacuum in the noth of the rays. Dr. Lenard, an adjunct to Hertz, extended this discovery two years ago by showing that the cathode rays can be made to pass out of the vacuum tube into the external space if the tube is and the with a court window of thin aluminum. But as soon as they pass into the external atmosphere they are rapidly absorbed; this absorption results in a theory-center of the gas. Various gases possess various degrees of this absorptive power, and the absorption in a given layer of a gas is proportional to its action of electric force. Such a medium is in all density. Solid bulles about them very much more probability a gas in a state of high tenuity, as for in-



Darrengey Strategy ( Huen-bandled entar in its onse of stath-correct enadlment) Photographed by Mr. A. A. Swinton through a piece of black

strongly on account of the greater density. The resulting fluorsycence in a gas seems to indicate that the exthade cave in posine through a cost underso a diffuse reflection, just us if the molecules of the gar were very large in comparison to the wave length of these rays. That the pullance which produces the fluorescence is really a continuation of the cathode rays is demonstrated by the fact that it is deflected by manuelin force. Rountgen's diseavery adds a new account

othe cathode mys. It shows that in addition to the heat and theorement light which the cathode mys generate in the glass of the vacuum tube whereve they strike it there is also another form of radiant energy generated there. Routgen calls it the Xrace. The race will and should of course be called the Roentgen mys. They are not cathode mys, neconling to the reports which have reached us so far; for although they are capable of producing strong floorescence just like the enthode rays they are not acted upon by magnetic force, and not only are they not absorbed by gases at ordinary pressure, but even the most oncome of all substances, that is the metals. are more or less transparent with respect to these new mys. Cardboard, wood, choulte, organic substances, etc., are about as transparent to them as glass is to the visible part of the spectrum. They are neither reflected nor refracted, that is not to any approximate degree. They act upon a photographic plate, but it is evident that photography by means of these rays cannot employ lenses and that the pictures obtained will be sluslow pictures. The object to be photographed is placed between the plate and the vacoum tube. It is to be hoped that these simlow pictures of the interior of living organisms will soon be perfected so as to show us the various parts in various shades necording to the absorptive power of

The question arises, What is this new form of mdignt energy? The report says that the discoverer has expressed, but with much reserve, his helief that it is a longitudinal vibration of the other. If so, then its velocity of propagation will in all probability be much larger than that of light, and therefore for the same period of vibration as that of visible light these new rays will have a very much larger wave length. Should this belief of the discoverer prove our red, then we shall finally have the longitudinal wave cathode mays are capable of passing through thin in the other for which we have looked so long, in shoets of metal like gold leaf, aluminum, silver, etc., under to avoid the necessity of considering the other

an incompressible solid elastic. It is well to usen tion here that quite a large number of very distinguished German physicists have within the last few years advocated quite strongly the theory that cathode rays are longitudinal vibrations of the other. Professor Januana, of Vienna, has published quite recently a very elaborate mathematical formulation of this theory. It is an application of Maxwell's electromagnotic theory to a medium whose specific inductive capacity and permeability vary under the stance in a Crookes tube. This theory will not nocount satisfactorily for the longitudinal character of the Roentgen rays.

The correct view of this new radiant energy will ental CATHODIC PHOTOGRAPHY. 252417 other

secossful Experiments Without the ce of Use of the Vacuum Tube-Pictures
Made in the Magnetic Field Without Light. Cor. Par Fel 6 1896 During the last week cathode phot

During the last week cathode photography has taken another step forward, it having been discovered independently at the same time by two experimenters that the vac tube is not necessary for the success of the work. During last week W. D. Crumbie, one of the assistants of Dr. Scherer in the chemi-cal laboratory at the appraisers' stores in this aity, made experiments with the cathode rays which brought about a result which was en-

His first experiments were made in th with a four-ingh industion coil connected with two Edison-Lalande phonograph ba teries. Two coins were put on a sensitive plate within an ordinary plate-holder for a small photograph outilt and the slide closed. According to the nature of the sildes the coins lute darkness. The slide which closed the holder was of the usual character-nestations varnished, with an inside coating of slate. The plate-holder was then put upon a table and subjected for thirty minutes to of the vacuum tube, which was placed across attleme and at hedgatta. has sublandated and and negative poles of the induction coll. The result was an absolute failure, no image being found on the plate when it was develop Mr. Crumble supposed the fatlure might due to the smallpess of the apparatus.

Immediately afterwards another experiment was tried with the same materials, but a brass plate was attached to the negative pole of the coil, the vacuum tube still being attached to the positive pole. An exposure of the same length of time resulted in an indistinct likeness of one of the coins on the plate with about an eighth of the circumference very plainly

In his third experiment Mr. Crumbia dis carded entirely the vacuum tube and placed the plate-holder between two brass plates. The surrent was continued for the same length of time, and when the plate was developed the coins were plainly seen. The Columbian coin was now and bright and came out with won-derful distinctness; the face of Columbus was misty, but could be easily made out, while the edges of both coins were as plain as if they had been printed on the plate with ink, From this Mr. Crumble deduces that the

ube is entirely unnecessary and that the cathedia shotographs are due to the setten to the magnetic field, and not to the rays of light from the vaccum tube, as no light whatever was used in the last experiment.

Dr. William James Morton, who has also

been experimenting with enthodic photogra-phy, is reported in the Electrical Engineer of to-day as having conducted the same sort of experiments, but in a different mannier, although arriving at practically the same result. The experiments will be continued by both men.



Through a Rat's Skin. This is the picture of the rat taken by a Yalo professor by the add of the rathode rays, as one of a series of experi-nts with the new pholographic discovery. Heavy horse of the redent's skeleten shows pishuly in spite of the tough skin, I even the gratie in its fail was pictured on the plate. 3525

THROUGH A RAT'S SKIN, Tournal - Fel 4 markable Photographic Experiments at Yale with the

U. U. Cathode Rays. 1896 In the Picture of a Rodent Each Particular Bone Showed with Great Distinctness.

PENETRATED THE ANIMAL'S TAIL. Professors Wright and Burnstead Ale Make Tests with Various Kinds of Wood-Cannot Reach the Human

Brain with the Rays. New Haves, Conn., Feb. d.—Experiments with eathede rays after the new photographic likening process are still in progress to take the scientists have been to testegal by people interested in learning sourching of the process that He has become shreat he are the scientists of the process that the has been demonstrated both by Professor. wright and Professor Burnstead that the Wright and Professor Burnstead that the new light will penetrate certain kinds of opaque bedies, and some of the results are simply astonishing.

Professor Wright has just photographe Professor Wright has just photographed a rat by the ener process, and the files of the animal and the hones of the leg show with great distinctions, although the rays were required to pass through a centling of balts, hide and flesh. The grately substance forming the interior basis of the exi's inil is visible and as distinct as the graphile care of the lead peculi proriously graphic care of the lead peculi proriously.

the portion of the steel shaft modeled by the handle ras nice seen. The frog shows up with great distinct-tion of the steel shaft of the steel shaft of the easily traced in the not the steel shaft of with the fish the results were not as seed, with the fish the results were not as seed, only the outline of the hunchbone being ob-tained. As English radnat was photon clearly disconsible to the interior seed of electry disconsible to the interior seed.

2526 EXPERIMENTS WITH Fell CATHODE RAYS.

Herald - 1896 Professor Pupin Obtains Gratifying Results in the Laboratory of Columbia College.

SEVERAL GOOD PICTURES

The Bones of a Hand, Nails in a Box and the Cogwheels of a Watch Faithfully Reproduced.

HINTS FOR EXPERIMENTERS.

In the laboratory at Columbia College yes In the laboratory at Columbia Collece year-terday aftermon Professor M. I. Pupin, the professor of physics of the finitiusien, con-tinued his experiments in the photographing of invisible objects on the librar hald down by Professor Reentgee, niceady explained in the liganan, and obtained very graftfying rouths. There were many students of the In the likutate, and obtained very graulifying results. There were many suiteniss of the college present while the Professor smale his experiment and explained the various phenomens as fast as they developed, and all waves most deeply interested in them.

"The first photograph taken by the Professor was of the hand of one of the attendance of the college. The picture was excellent and aboved the banes and obtains of the name and obtains of the real of the college. gers and of the body of the hand very rie y, the first appearing on the plat-

illing sindow.

Next, the Professor put some nails in an aluminum box, facused the rays from the Creokes tests upon it, and in a short while had a picture of the nails in all their details nearly as failiful to the originals as it they had not been conclosed in a box.

Age encountered.

The management of the control of

obtained.
The wizard Edison regards the results he has thus for obtained as slight, but hopes for fully satisfactory ones as soon as his new appropriate it made.

COLUMN TO THE PHOTOGRAPHY.

MONTHEAL, February 7.—The experiments with cathods photography applied to surgory are being earled on at McGill University with are being certed on at McGill Uniteresty with great success. This morning Prof. Cox ex-perimented on a patient, who land been shot in the let it of about Christians. The built could not be located, and the man suffered in-tense pein. The woman hast closed up. The legs was photographed, and though it took forty-the minutes, the builder was found.

#### 3529 MARVELLOUS FEATS OF ROENTGEN'S INVENTION.

Journal - H. t. Feb Y Both Sides of a Medal Can Now Be Photographed Simultaneously. 1896 \_\_\_

Muscular Development of Live Serpents May Be Minutely Traced by His Contrivance.

CENTRAL LABORATORY FORMING. The New Discovery is the All-Absorbing

Topic in the Fatherland—Differences Stones and Imitations,

By Henry W. Flacher. Berlin, Feb. 6.--It seems as if nearly every other word heard in public and read in the press just now is "Roentern." The wonderful invention constitutes the principal topic of conversation in the clubs and cafes and in the family.

A central laboratory is just now forming in Prankfort for the purpose of propagating Professor Rosutgen's discovery on an extensive scale.

Here are some of the latest results of an periments with the new contrivance. It to now made possible to photograph both sides of a medal, simultaneously, and to locate needles in and the decemeration of hones and joints.

It no longer requires a connoisseur to detect a false diamond. The Reenigen probetween all genuine precious stones and imitations. This includes pearls, which are the ended of all to imitate

Most astounding of all is the fact that by the new discovery even the muscular development of live servents may be minutely traced. The time of express ranges from three to five minutes.

#### 3529 TO PHOTOGRAPH A MAN'S BRAIN.

Startling Experiments Edison Means to Try at His Laboratory in Orange To-Day,

Accall TES WILL SHOW.

His Labors Have Already Resulted, in a Decided Improvement on the Crookes Tubes. 8th

ALL COLLEGES INTERESTED.

Picturing of the Invisible Going on at Columbia, New York City, and Princeton.

Unless his plans miscarry, Thomas A. Edi-

tendral Flaust the Wester Suphy vessels with the sensite in heat time for evidence from the sensities of the sensite in the sensite of the se

The following marks of ready of a long of greater was a second of the control of

short the course in the country of related spins. I want to be a second of the country of the co

cathod rare. As a rount or the experi-lents they have much be professions at the most interpretate of the category is only or the most interpretate of the category is only the most interpretate of the category is of a round or the category is of the category is a somewhat that is the large of great of the category is of the category is of the category in the category is of the category in the category is of the category is of the category is of the category is of the category is category in the category is of the category is category in the category is of the category is of category in the category is of the category is of category in the category is of the category is of category in the category is of the category is of category in the category is of the catego

The state of the s

EXPERIMENTS IN LIGHT RESEARCHES.

SUPPRISERTS IN USERT RESEARCHES.

A Profession in Montangia was believed as in the Value of the Discours, in the Value of Value of the Value of Value of the Value of Value

### FRENCH STUDIES OF ROENTGEN'S RAYS.

Experiments by Paris Scientists in Photographing Through Opaque Bodies.

and the second of the second o

REMARKABLE CASE IN LONDON

A Paralyzed Sailor Onite Cured. Head Discovery. Fal & OTHER NOTEWORTHY CASES.

Present the Stressons Edition of the Heralds, frames Beneziero, of Wordston, that photographic theory is the stress of the stres

All resident erems, the ran can the conjectured of the Tayland and the Tayland

and half been bound in a very discretion country of the control of the country of

"X" RAYS AT YALE.

Students at the University Crawl Through Windows to Hear Professor Wright.

FACULTY IN THE THRONG.

Several New Theories Advanced Concerning the Cathode Rays and Their Effects.

CREDIT IS GIVEN TO LENARD.

Shot in a Rabbit Shown in a Lantern Slide by the Lec-

Fet 12 1896,

jur transparer to the manage.]

New Haven, Conn., Feb. H. 1894.-The great
interest in the recent discoveries of the use
of cuthode rays in photography burnt forth of enthode rays in photography burst forth at Tale University the evening in a most unique way. Arthur W. Wright, professor of experimental properties, who is in charge of Shons Laboratory, and who was the first American to comirm the experiments of Reeningen, delivered a lecture in Slean Laboratory on "Cuthode Rays."

Lalloratory on "Cuthode Rays."
The ireture was not generally unnounced.
The meashers of the faculty who consists that all the faculty and their releases that all the faculty and their friends should have a chance to get reats, but long before the bour ret for the lecture students and the Bour ret for the lecture students and towasproude began to gather in crowds. There were three other lectures in the uni-versity this avening, but this fact side not safect the attendance, and the hig lecture rocean was filled in a few minutes ofter the doors were thrown open. Traftrage Andrew Phillips, seeing that the Traftrage Andrew Phillips,

I'referent Andrew Phillips, media that the facetily and their friends would not be able to get in, tried to act in deorkreper, but stail to get in, tried to act in deorkreper, but stail to get in, tried to act in deorkreper, but stail to the stail to get in the stai

3532 Dr. W. J. Morton's Experi-

ments in Search of the

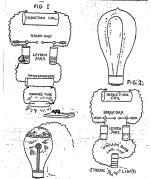
The World Fel 10 FINDS A WONDROUS RADIANCE.

----1896 A Field of Electrical Excitation Produced in the Space of a Wire Basket.

FUTURE OF THE FORCE IN SURGERY.

Simple Lines Upon Which Amateu May Work in the New Pield of Scientific Research,

The simulations of account of the simulation of



DR. W. J. MORTON'S ARRANGEMENT FOR CATHODE RAYS.

of the average feather colors, it is even to consider the construction of the control of the colors of the colors

Bestlets over the six and marks, resistance of the cheek, say, rec illustrating from the Light, agrical wire basists in made with the six of interfection where he is light of the six of t

3533

Mr. Edison Will Not Attempt One Until Satisfied with His Preliminary Experiments.

HE MAY TRY IT TO-DAY.

Devoted Yesterday to the Preparation of Tubes That Will Give the Hera Felt 1896

LIVING SKELETONS PICTURED. Professors at Trinity College Make Some Interesting Experiments

with Striking Results

The fact that yearerlay was he forty-middle Northsky and an occasion that might, the state of th

Agent experiment into he started on an Mr. Diston was a sentertainly and thatty as ever as he went about the superfurnits, the said he would have to protyon, be brain to eath the would have to protyon, be brain to entirely assess of the said to the said controlly assess of the said to the said controlly assess of the said to the degree of vacuum be get in the tubes, but he longed of vacuum be get in the tubes, but he longed to be prepared today to try it. In cords he early in the marting, when there would be early in the marting, when there would be no speciators about, as he Gearet the pres-sure of the latter adjall reside the other latter adjall reside the problem of the said of the said of the said value of the latter adjall reside.

The want security, Mr. Kallson has practically decided on the

when the White does not the writing the water of the wate

The second secon

Professor Wright, of Yale University, re-cently elatance a fine sindowgraph of the beay structure of a rubbit, and upon ex-mining the photograph more closely dis-covered a number of small dark spots on it.

He then dissected the rabbit's bedy, and found the dark spots had been made by small shot embedded in the animal's flesh.

PHOTOGRAPHED CERICANNE ELECTRO-PHYSICS AND MAGNETISM. 1876 EILECTRO-HUSSIG AND MANNETHEN [Pp].

Enting's Tolly [18th 24] Rootport flow; The Loss Life, Pp, Ps. 1, in a sellurist, respict to the respiration of the property of the principle of the property of the principle of the principl toom turson a unrect of fight, makes phone some restarction which he has been earrying out for a storage battery through the past two years on photography behind bodies opaque to ordinary duction cell at a volta light; his experiments prove that ordinary light, or at least certain rays,

S, rays, from a Court Configuration of the Court Configuration of the Court Co

substantiant of residuely.

The state of the

TO CONCENTRATE RAYS. Dr. Kolfe Working on a New Vacuum Tube of Great Power—Professor Peckham's Successful Experiment.

Dr. F. S. Kelle, of No. 701 Pourth ave-Dr. F. S. Kelle, of No. 701 Fourth aver-mus, Broeklyn, has een experimenting with Hoenicken rays in the phetography of the human head. He has made two pheto-graphs of his little brother's head, which show the skull in profile considerable distinctness, and also the cartilage of the

The new vacuum tabe, that he is cond-dent will concentrate the X rays, is a sort of double tube or bulb, the outer shell of which is eight and a helf inches in length, and doder not contain a yearum. In its ch is elight and a half inches in hough, dodes not contain a vacuum. In the is an aluminum window, two and a lanches in dianetee. The inner bath is high degree of vacuum. Through it has only been a new months of the order subth are forced the cutter of the order and are one warmounted another poles, which are surmounted within the disce, one and sorre-dights of the cutter of th

luches in districter, and are mounted an plantinum road, where they are sized in Tab inject received by the size of an inch in this inject received by the conservation of an inch in this inject received by the conservation of an inch in this inject in the conservation of an inch in this inject in the conservation of an inch in the conservation of the conservation

ear, nos die will ter patographies wich wir Arguer Perkhan, of the delephil consequent processing the second p

Hopkins varied to find set if the bosses were knitten groperty. Heapthin varied to find set if the bosses were knitten groperty. I trust of place the bodier. The Unions rule was placed at incises own from the place. After an exhibition of the set of the

EDISŐÑ SENDS RAYS THROUGH OAK LOGS.

> Developing the Most Extraordinary Ponetrating Powers with His Tubes.

Professor Pupin Photographs the Shot in a Wall Street Law-

ver's Hand. BONES FAINTLY SHADOWED.

The 23 I Station has been obliged to spain postpone his enleavor to get a picture of the human bresh with the said of the Uncentgen, er N. 1739. He had confidently expected to make the edge of the said of the special to make the edge of the the said of the edge of of the e night before, but had to give it up at the last moment breams he could not get the Crooken tubes to work to his antisfaction. Crooker tubes to work to his antidaction, by, fitter a hort and now relative work ex-lations are supported by the control of the con-linities late lowers of year-endy meeting ther-mosphy fagued out, for be had been up and at work overy night during the week.

The country of the control of the con-trol of the control of the con-trol of the control of the con-trol of the con-trol of the control of the con-trol of the con varied fate there, shish is each the ranse of segment of more-core, "to the catholo rays experience," the teached rays represent the segment of the segment

35370 RECENT RESULTS WITH X RAYS.

Rays Modified so as to Pletture Tissues— Are They Produced Without Electricity : -Prof. Thomson's Experiments on the Langitudiest Vibratics Theory.

Langitudiesi Vibratica Theory.

In Europe the investigation of Frot. Rindpack discovery is being carried on with an
much eathnaism as in this country, and apparently under more favorable conditions, for
the German excrementers seem to know the
samet process used by Rindigen, the manner
in which in onsided the destrictive and tha in which to enabled the obsertisity and the force of current used, andress which as-arcedly have not been at the economic of the control of the control of the control of the learn from their own experience. The control plants from their own experience which the con-pletizers in consequence have been much clearer and more assembling than then per-decurrent own experience of the control of control of the and to funnessy the precess, others whether and to funnessy the precess, others whether and to funnessy the product of the civility or mit. and others still are puzzing with the scienti explanation of the phenemenes

explanation of the phrameteron.

At Bartin experiments now being constantly made at the Military Anolemy and luftero the Physical Society. Recently it was discovered that the rays can be used to distinguish true seats from faile. A string of mixed red and failso postis exposed to the rays showed on the exhibited plate dark gruppe masses for the real leastly, and almost tempspectar types for the least seat of the property of the real leastly, and almost tempspectar types.

with the control of t ture till mininght, and found he had takes a excellent secure. He is now trying to excellent secure. He is now trying to excellent secure at the industrial Receivers of the old and of Receivers as coursed by electrical action of the semantal faced.

Frod. J. J. Thomson of Cambridge University has been making making receivers the receivers and the receivers the secure of the beauty of the beauty of the secure of the sec



Photographing a Broken Wrist. Professor Peckham, of the Adelphia Academy, Brooklyn, uses the Roeters

and the same of th

When the Wilson's control of the western control of the control of

made.

Professor Wright, of Yale University, re-cently obtained a time shadowgraph of the boay structure of a rabbit, and upon ex-amining the photograph more closely dis-overed a number of small dark spots on it.

2534 PHOTOGRAPHED SKELETONS.

Faculty at Trinity Think didison's Brain Experiment Will Fait.

FRUIT STATE OF THE CONTROL OF THE CO

MATHEMATICS IN PHOTOGRAPHY. How Professor Trambridge Finds a Bullet in a Man's Leg.

Mn's 1-go manner. Mn's 1-go manner. Mn's 1-go manner. Mnas, Peh, 11, 187,—Proclassor Transferdie, by the application of well known mathematical principle, demonstrated to manner. Mn's demonstrated to the annotes, our there was mostly to the back of the limb.

Its limb was in the front or the back of the limb.

Two dires in Crookes tubes were set at a create in construction of the limb.

Two dires in Crookes tubes were set at a create in the limb was a construction of the limb was a foreign holy. These plates also made a foreign holy. These plates the limb was a foreign holy. These plates are the limb was a foreign holy. These plates are the limb was a foreign holy. These plates the limb was a foreign holy. These plates the limb was a foreign holy. These plates the limb was a foreign holy was a foreign holy was a foreign was a foreign

PROPERSOR BLAKE PROTOGRAPHS THE BOXES OF PROFESSION BLAKE PROPOSITATION THE BOXES OF SIR BLAND SWITT A TUBAL CALL.

LAURINGS, ROM, Pole, II, 1856.—Lucien I, Lauringse, Rom, Pole, II, 1856.—Lucien I, Lauringse, Rom, Pole, III, 1856.—Lucien I, Lauringse, Rom, Pole Case Of Physioles III the Kanasa Grand State of Physioles III the Kanasa Grand State of Physioles III the Research of the Company 3535

stinguish this disense from periostitis. ee precede inward from the surface. tains a very brief communication from the thus a very oner communication from the eferring to some experiments with the sum eferring to some experiments with the sum for some years for the generation of coose t discharge and in which a comparatively its is used in connection of correct and its either an internation for the current Af frequency; it seems the force is pre-ingly and the control of the control of the presentation of the control of the control in the control of the control of the control of the presentation of the control of the co obparatus several tubes could be operated when only a single tube is used is not ap-nal apparatus; the piercing of the tubes is results were also obtained with ordinary nt of which was made one pole and an exthe other. (This seems to be the appara-

Sayz. PERRIE. Lond. Elec., Peb. 14.-A med in the Digest, Feb. 22. p Kervin, Lond, Edv., Peb. 14.-An dress to the Royal Society in November,

Discharger. Suymnepauw. L'Ind. Elec., my paper in which he shows the difference synamic sparking voltages. Walker, Lond. Elec. Eug., Peb. 14g his theory. (Digest, Feb. 22.) gg ms theory. (Digget, Feb. 22.)
furplext. Loud. Rev. Rev., Peb. 14.—An
magnet designed by Holden, which has
solveich arsenal for the hast four years for
lindrical short the magnet is shaped like
and having a single coil around the nenit on it in about, doubter, and

and saving a single con around the neu-it to fit the shot; duplicate twin wires are sits in case of the wire breaking; the cur-operes at 20 to 30 volts; the weight of the rimum weight lifted exceeds 3600 pounds heaviest shot.

noticed a preniar phenomenon; while is electrodes and gradually reducing the certain critical point at which the nature o become like the discharge of a Holtz been disconnected; the light becomes a falls to about one third and the voltage oner value; if the distance is delicately ce back and forth as though there were was in unstable equilibrium; when the the negative electrode becomes intensely electrodes 5g in. in diameter the critical dimeter read 350 and the ampere-meter ill; when there was a true are the curout soo; the negative electrode became zone was liberated in large quantities and to a regular gas discharge; he thinks the sile is due to one of the properties of present some more accurate and com-

ous of Sterousopte Photography. Hines-reprint in the Elec. Eug., Feb. 26.—When a field in the ordinary way they simply form sed lines, but when the photographs are onfused mass of lines resolves itself into with its peculiar shape and its true posi-under which the sparks are produced the general character of the spark can thus

Jour., Peb. 15, states that Mr. tion of these rays for the tempering of at astonishing results with aluminum. sch an extent that it was scarcely recogs given. as an article by Prof. Stine describing

mul publishes brief descriptions of other opers, containing, however, nothing of Rays. Peans. Elec. Eng., Peb. 26 .-

red to above. Booke system. Sr. Amer., Peb. 29.-Ar are system, which has been described in

TO CONCENTRATE RAYS Dr. Kolle Working on a New Vacuum Tube of Great Power-Professor Peck-ham's Successful Experiment.

harm a successful Experiment.

Dr. P. S. Nolle, of Ns. 701 Faurith avenue, Brookiya, lass een experimenting with Hoenigen rays in the photography of the human head. He has made two photography of his little brother's head, which show the skull in protis with considerable distinctions, and also the cartiflage of the

nose. The new vectors tube, that he is cond-The new venture title, that he is confined with the property of the property o

day, and he will try phrographing with at Carlon and the will be provided by the control of the Adelbal Acta-carg, Brooklyn, his added a practical teat of a control of the control of the

power the weak of the power as the power power power power as the power pow

EDISON SENDS RAYS THROUGH OAK LOGS.

Developing the Most Extraordinary Ponotrating Powers with His Tubor.

Protessor Punin Photographs the Shot in a Wall Street Lawyer's lland, BONES FAINTLY SHADOWED.

A shade principle and assessment of the control of



25370-RECENT RESULTS WITH Y RAYS.

BREEF DESPOILS WITH X ANTA - Har Mark Mark of the Primer Through a primer through the primer through through the primer through the primer through the primer through

and not make the undergrave statement and an advanced limit are sorting with the arbeitalt explanation of the photograms, and advanced limit are promiting with the arbeitalt explanation of the photograms, and are some and are to distinguish true and faine routle exposed in loss and nothing are some and faine routle exposed in the max allowed not the small field that offer opposed in the max and the statement of the sort of the real reality, and distinguish true may define the sound faint indication of the should be applied to the sound faint indication of the should are sound to deliberting when are the sound are sound to deliberting the sound in the sound faint indications of the should are sound to deliberting the sound of the sound in the sound in

services to the company of the property of the company of the comp

Photographing a Broken Wrist. Peckham, of the Adelphia Atademy, Brooklyn, uses the Roeige

VILLEGO AL DOGGERA VALADA O O O 

# TESLA'S LIGHT \*\*\*\*

Herat ) Way 21 . 1896 After Years of Endeavor He Declares Its Success to His Friends.

STEADY AS THE SUNLIGHT.

While the Incandescent Lamp Gives but Three Per Cent of Hinmination His Produces Ten.

TO INCREASE IT TO FORTY.

No New Dynamos Necessary, the Current Used Being from the Street Circuit.

Nikola Tesla has solved the problem which before illusted many pears ago, and force illusted many pears ago, and the solvent of the pears of the control of the control of the solvent perfect adaptation of the great pears perfect adaptation of the great pears and the solvent pears of man, and the solvent pears are solvent pears and the solvent pears are the the solvent pears a

without the attendment occurrent was and without the attendment occurrent with the many of the attended and by the three by them. My reason was a superior of the attended and by the attended and the attended and the attended and the attended and attended attended and attended attended and attended at

TESLA'S BRIGHTLIGHT WHAT EXPERTS SAY.

Apparently Most Simple in Con- MacFarlane Moore Is Possimistic struction, Yet Its Penetrative . When Discussing the Claims Power Is Enormous. Put Forth by Mr. Tesla.

HIS TRIBUTE TO MR. EDISON, LIGHT FROM VACUUM TUBES.

Will Not Make Public the Principles | The New Method May Become of Comof Ris Light Until He Is Able mercial Value, but Is Too to Save More Energy. Costly Now.

NOW HE LOSES NINETY PER CENT. T. C. MARTIN HAS MUCH FAITH. When He Has Reduced This to Sixty Max Osterberg Bolieves in the Possibil-

ities of Success by Some Experimenter,

1994 — May A W.

How soon Nikola Yarda Wil control to make the horizontal to make the horizontal to make the horizontal to the way to the horizontal to the will present the discovery lefter to the will present the discovery lefter to the horizontal to the will present the discovery lefter to the will be t Nikola Tesla's claim that he has perfected a system of lighting by means of excited vacuum tubes has aroused great interest in the electrical world, and provoked no end of discussion. The matter is the one leading the dectricul world, and provoked no end of discussions. The matter is the one leading topic of conversation at the Electrical Exposition. In the Grand Central Palace, where experts in electricity and more versed in the experts in clearing and more versed in the mysterics of vacuum tubes are to be found any and night.

One of these is Mr. D. MacParlano Moore, who has invested a system c. massing by means of vacuum tubes, and who calls the light thus produced "etheric light," When I spoke to him about Teela's light he

"Yeels. No years ago mide a for experi-ments and prophesic of arrest edge, but, just-ling from reports that were published com-paratively receively, as found the reat a hard property of the read of the read of the way beyond what made but little bend-way beyond what has made but little bend-way beyond what has been been been as most two hundred years. I think of the selectic strike in lighting a whole letture selectic strike in lighting a whole letture lighting and the read of the read of the lighting and the read of the read of the lighting and the read of the read of the lighting and the read of the read of the read of the lighting and the read of the read of the read of the lighting and the read of the read o

433

and without their attendant per andmenta and without their attendant persists and equatity, with nothing axe a vacuum and the quatity, with nothing axe a vacuum and the persists and the second and the second control of the notecutes. The introduction of the melecute, with the persists and the second control of the notecutes. The introduction of the melecute, with persists and the second control of the s

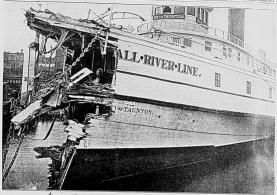
Per Cent He Will Give Away

Chunks of the Sun,

1896 - 1894 24

#### Charles Batchelor Scrapbook, Cat. 1328

This scrapbook covers the period 1901-1914 and contains clippings about a variety of subjects. Included are items relating to aerial navigation, high-speed locomotives, and serious train accidents. One clipping deals with a Massachusetts Institute of Technology alumni dinner featuring "liquid sunshine," at which guests drank cocktails containing radium. Also included are political cartoons and a map of the Panarma Canal. In addition, there are photographs depicting the aftermath of the 1906 San Francisco earthquaker, Commodore Robert E. Pearly sarcic exploration; the construction of New York's Manhattan Bridge; the New York ceremonies held in honor of the U.S. forces lost during the 1914 capture of Veracruz, Mexico; and the severe flooding that crippled the Paris region in 1910. The pages are unnumbered. Approximately 130 pages have been used. The clippings are individually numbered 1-267. Several loose items have been inserted into the scrapbook.





THE "PLYMOUTH" AFTER HER COLLISION WITH THE "CITY OF TAUNTON THE COLLISION OF TWO LONG ISLAND SOUND STEAMERS.

## Railroad Employes Tell of Blunders That Cost 28 Lives



DAY COACH, AND BAGGAGE, CAR

#### Inquest Is Begun on Grand Trunk Disaster-Despatcher Gives Evidence.

Wyontse, Ont., Monday.—Inquest into the wreek on the Grund Trunk Rallway at Wan-stead, which cost twenty-eight lives, began to-day.

to-day.

Despatcher James Kerr, who sent the train
from London, said he wired to the Watford and Wyoming operators simultaneously
to have the express meet the freight at Wan-Soon afterward Wyoming reported that the freight was slow in getting out. Kerr then called Watford and asked if No. 5 was com-

ng. Watford's reply being "Yes," Kerr said,



## FRENCH AIRSHIPS TAKE LONG FLIGHTS

Successful Trips of Lebaudy Steerable Balloon and of "Santos-Dumont No. 9."

ROUND CATHEDRAL SPIRE

M. Juchmes Flew to Mantes and Returned to Starting Place Against the Wind.

PAID AN OFFICIAL CALL

M. Santos-Dumont Skimmed Over Trees of the Bols to Get Permit from

L CAMES TO THE HERALD.]



RECENT PHOTOGRAPH OF THE LEBAUDY AIRSHIP.



The HERALD's European edition publishes the following:-Ine following:—
There was little air in Paris this after-noon, but what little there was was con-quered by M. Santos-Damont, who went out in his air ahip "No. 9." and simply handled it at his own sweet will.

at his own awest will.

M. Santon-Dumont related his exploit to
the HERALD correspondent as follows:—
"There was quite a crowd outside my little
party at Neully; at about four o'clock, when
I gave the words "Let go," and, looking down
and behind me, I saw automobile carriages,
motorcycles and bicycles following my cours.

My three and a half horse power motor and
rudder worked admirably.

rudder worked admirably.
"When I arrived and descended at Bagatello a 'garde' came up and asked me if I
had permission to cross the Bols in an aiship. I looked at him in wonderment, but,
sting up the matter at once, I replied-I
haven't one on me, but I'll just call on M.
few minuter time. Two garde dorfeel has
tepl and said that there was no hurry and

rigid and said that there were no hurry and say I atlied.

The say I atlied.

The said is Servener Bridge of the said is servener. Bridge of the said is servener. Bridge of the said is said in the said is said in the said

"I am delighted with this little tey mu-chine. The pleasure of riding in it is in-describable. Yeaterday I turned it at my will. Automobilism is not in the same afreet with it. I shall not go out to-morrow, but perhaps I may have a sty on Sunday after-

noon.
"My new balloon, "Santos Dumont No. 18,"
will be ready in less than a month. I am
making arrangements to carry twelve nosengers and two employes. I have the
greatest confidence that it will prove a suc-

Cess."

M. Juchmès, the aeronaut of MM. Lebaudy, also made a long excursion in their new airship. The following is M. Juchmès'

new already, "The following is M, robushed," and the control of the journey of the control of th thus coshly moved against the wins and etered for the Chateau de Ressy. On ar-riving at the park I manesuvred the airship in overy direction. It obeyed its heim par-fectly. Then I steered for the balloon shed at Moisson. The landing took pace past be-fore the door, and the cirably was put into the shed without any troub.

"The journey may be summarized (thus:—Start in rais at fifteen minutes to nine A. M.; route, Maison, Lavacour, 18, Marina, Dennement, Passicourt, Mantes, Limay, Rony, Starfanzourt, Mercury, Mosseau, Hony, Starfanzourt, Mortourt, Mosseau, Valence, Marina, Marina, Valence, Marina, Marina

distance covered, if kilomètres (2) miles I prirong) maximum. Meatires and this attitude is exprised to the control of the battude is exprised to the control of the battude is exprised to the control of the batines to the control of the control of the batines the vestilator worked without stopping to replace the exemping gas.

"We were acclaimed by the population all 
along our route."

#### ELECTRIFIED POOL A DEATH TRAP TO FOUR

Victims Stricken on Touching Water in Pittsburg Street.

Broken Wire Bearing High Current Had Fallen in Storm-Three Killed



The American Falls at the Normal Flow of the River.



The American Channel Looking Toward the Mainland from Gool Island. The People in the Distance are Walking up the Riverbed at Midstream, where the Rapide Usually Tors with Great Pary.



The American Falls on March 22, 1903, when the Waters of the River were Diverted.



12 THE YACHT

THE VACHT
AMBRICA.

7 th Either 17th New York Trans;
7 th Either 17th New York Trans;
7 th Either 20th Trans;
8 the Transport to the first product to the fi

of what was called the "troot cable." He was a fine perturban and was much rereserved and extensive by all who know him, 
when the second by all who know him, 
the troot fishing and yeart calle.

One day Mr. Purmas brought out and 
one day Mr. Purmas brought out and 
which he and head been ver miling yeach 
which he and head been ver miling yeach 
which he wad head been very and 
to be to be a second 
to be a second 
per and the per and 
per and



A WORLD OF MIGHTY WATERS,

THE THESE BACK STATE DESCRIPTION OF THE STATE BACK STATE DESCRIPTION OF TWO BRITTENS AND THE STATE BACK STATE

Something went arrong with a Fordism troller on which left 13th street and Third avenue at 7:30 last evening, and the current leaked all mound the three lack seats. leaked all mound the three back seath. Before the ear was finally laid up in the harns at the end of the route six or eight passengers had been hadly shocked, a number of others had felt a good, lively touch of the current and had been budly searred, and bach the motorman and con-ductor had been thrown to the parental while trying to beam what the trouble was Everything was peace until the cur reached 145th street; then a yell went up reached 144th street; then a yell went up-from the persons who were stiting on the three back seats. They fell sprawling on the floor, hats floor in every direction and there was a seramble to get off. All of the purvengers in the back seats managed to get away from the current by climbing

over the backs of the scats, except Mrs.
John Allen of West Chestor. She was
rendered temporarily helpless by the current and couldn't budge. Several passen-gers managed to pull her out to the street She said she had been severely shocked. cur was delayed about ten minutes while the conductor, Benjamin Smith, tried to find out what the trouble was. He gave

to find out what the trouble was. He gave it up as a hair job, got some roops, harred the estrance to the dangerous seets and their starred the ear. Nothing went wrong with the other seats, and Smith thought his trouble was over, but it wasn't. At 170th street a crowd-returning from a pienes was wealting for the car and mande a raish for the ruped-car.

"Don't go in there; these seats are dangerous," said the conductor.
"G'wan, that don't go," answered the pleniciters, and in they rushed, pulling down the ropes. The conductor expected to see them jump into the air as they took seets,

but they didn't, and everything scenard to be all right.

The car started uptown ngain, and but gone a few blocks when, just as the conductor consected with a nicket an old man was suring blim, the current got loose

pain. The conductor came to in the middle of the street pretty ladly braised about the head and side. The passengers in the leads want through the same experience on their predecessors. They either jumped or fell but in a hurry. The old man also got quite a seven alock. He said he was William McKny of Wakelleid.

William McKey of Wekelleld.

"All out," yelled the conductor, and the passengers needed no second invitation. Then the incotronen, Michael Matter, went I had to investigate, enrying the brassic controller handle with him. The handle touched a bruse rail and Muser was knoched down, but ween't lord.

Maser and the conductor undo up their minds then that they had had enough, so they ran the ear to Fordham, where it was laid up for renairs.

It was reported that a woman named Annie Smith, who lives in Mount Vernon, was shocked severely.

No one was hurt very much.

LIGHTNING BORES FLAGSTAFF.

on counts have been mode by the best of experiences, one on counts of crosses and experiences, one one of counts of crosses and one of the counts of the cou out Displacing the Pole. Lightning played a quoer trick recently Lagatining suyen a quoer trick recently in a Websterfield Avenue bara. Sometimes it strikes and tears everything to piccos; at times it will burn, and still other times it will come and go with hardly any dan-age. It bored as pretty a hole in a flagstaff

NEW YORK, SUNDAY, JULY 5, 1903.- Coparight, 1000, by

NEW PACIFIC CABLE OPENED.

ROOSEVELT AND TAFT EXCHANG-ING GREETINGS UNDER SEA.

Message Sent Around the World in 9 1-2 Minutes-Carried Congratulations Back to Clarence Muckay at Oyster Bay

to Garanes Muericy at 1994." Big.

— Gire, Targith Sept.

— Gire, Ta at Ministin as voscosy Salanish formulally opera-tions on Simulys and Salanish formulally opera-tions on Simulys and Salanish and Salanish salani later the reply of flov. Taft came ticking into the telegraph office here. Soon afterward a message was sent com-pletely around the world in nine minutes and a hulf.

The President's message was as follows:

us could have been made by the best of

orived by the operator working on the

next infricts.

From an early hour yesterday morning all the breats of the Pectal Telegraph Co in pany were oncluty here It was expected that the last connection, at Hombalts, would no make at about 2 o'doods, New York through the particular W. H. Indeer, Edward Telegraph Company of the Period Company of the Period Company of the Period Company of the Period Company of the Compa

this despetch was seen from risonaucus.
3.30 in the interanon.
3.30 in the interanon.
5 The Cubbe huilding was decorated from the ground to roof yeederday with flags and bunsting to celebrate the opening of the new cubbe. The outranee to the building was arched with an artistic arrangement of the national colors, and from every

and a half.

The present surrougs was no federeck.

The present surrougs was no federeck.

The present surrougs was no federeck.

The present surrougs was the present surrough the surrough ten better surrough to the surrough ten better surrough ten surrough ten better surrough ten surrough

well yesterday is the first that has really gone around the world. In 1886 whose ho opened the National Electrical Exposition at the Grand Central Palece, Senator Chamacoy M. Depow sent a despatch which was amposed to have traveled around the pictor. As a first property of the property most the inclusion and devertopouse of the all the Grand Contral Paleon, Simustic March 18 to non-report the contract of the c

from the Prediction and was defineded to Consecutive William and searched the sensing of the incompanion of the Consecutive William and searched the sensing of the incompanion of the Consecutive William and the Consecutive William and the Consecutive William and the Consecutive William and Mantha to Hence Research The sensitive William and Mantha to Hence Research William and Consecutive William and Consecutive

trees in the deliging from out, and drown and the second of the second o

Under telephoned it to Mr. Mackay, who immediately got into his automobile and with his wife made a flying trip to Oyster

with his wire made a flying trip to Oyster Bay to be on hand at the ceremony. As soon as he arrived Supt. Usbor sat

are some promisent in the definition of the production of the prod

To the President To the President:

I thank you deeply for your message a nd I
carnestly hope the Pacific cubic, by opening
the wide horizon of the great East, may prove
a meful factor to the connerces of the United
States.

CLAMENCE H. MACKAY.

does interested in the enterprice had all most count to believe that the electronical phase of the day beam of the day of the da

CONGRATULATIONS TO TAKE From Cleveland, Root, Miles, Architchen Ireland and Mayor Low

As soon as he arrived single, before an other states of the state of t

CHATTANOGGA, Tenn., July 4.—Immediately after arriving in the city this morning Gen. Nelson A. Mikes proceeded to Chickanauga Park to Inspect Camp Thomas. He sent this despatch:

I thinks providently for trow names a nail recovered to the control of the contro



Boffolo BRILLIANT ARGENTINA. 701, 25 Coulter The Tilting Rock at Tandil.

JULY 21, 1903.

#### LIGHTNING HIT DOZEN CHILDREN UNDER TREE

All Rendered Unconscious and Several Temporarily Blinded.

Girl May Be Permanently Crippled --Boy Lost Clothes and Dog Its Hair by Bolt.

A desir children of the lorux were restored histonically, several were lempocard-prilabelled, bad can key had his delette torn the several way to be a several way to A descriptibilities of the hirony were renminured by the lightning. Willie, thirteen years old, was sitting against the trunk of the tree, and the holt pussed down his shoulder and breast, and habite his left leg, leaving a continuous burn three inclusive wide. His sister Sadie, fifteen years old, and his brother Harold, eleven years old, when were stitler brothe burn. who were sitting heside him, were ren-dered temporarily blind, while Sadie's for dered temporarily blind, while Budde's fort were paralyzed, perhaps permanently. Witnesses of the accident say that it had not yet begun to rain when a ball of fire struck the tree with a terrific report, and the down the trunk, estipping off the bard and consuming the follage with a burst of smoke and fiame. Several of the children were gathered

around the trunk, but most of them were standing in a group about a swing sus-pended from a limb. They were all hurled to the ground by the shock, and by there metionics.
The parish house of the Church of St.

The metab louse of the Charles of St. The twisters in Er. Petaber Paris, exhibits the twisters in Er. Petaber Paris, exhibits appeared of the second of the Philip Meri adjoins the lot, and in one of

LIGHTNING BOLT'S FREAK. Wretked a Bicycle, but Did Not Touch

the Policeman Who Was Riding It. Bicycle Policeman Nicholas Clemensen of Steepy (M); was, the victim of a strong-freen of High-High guidency selected, steers. It was reliter about the thinders Bottler. It was reliter about the thinders Bottler. When the thinders are the strong when the thinders are the whole was restored by Hightham. Persons when this proposed the rections any the elec-tron the wheely not full may be for-tly widely within the strong of the con-lection of the strong of the strong of the two wheely noted that most force, it is from the wheely not full most force, it is from the wheely not full most force, the control of the strong of the strong of the force of the strong of the normal their two strongs of the strong of Jersey City was the victim of a stronge

SOMERODY SAID "RATS?

SOMERODY SAID "ACT'S"
Why a London Marcoul Demonstrater
(MG, 7 the MG, 7 the MG, 7 the MG, 7 the
(MG, 7 the MG, 7 the
(MG, 7 the
(M

when altogether—the Marcool and similar devices, these inventions take their place for consequency for spoofal uses. The Weetstone apparation is suchul where labor is bundled, or where wifes are searon, as in 8t. or where wifes are searon, as in 8t. or where wifes are searon, as in 8t. or when the spoofal uses the same place of the spoofal uses the spoofal uses

which is harmond control was and the conmoney of manuscript. Statement of the 
money of the control of the 
money of the control of the 
money of 
money of the 
money of 
money of the 
money of 
money of the 
m

tomer. In the contraction of the following contraction of the contract

York to Los Angeles, Cal., Made in Less Than Three Days.

off all previous records.
The record-breaking run just flathed by
Mr. Leyen was undertaken to gain the bedflathed by the record of the recor Los Angeles should be made at an average speed of thirty-five miles an hour, include

As the train passed through Missouri and Kansas it was found that faster time than the schedule provided could be made. Or-ders were then given to make us fast time series were table given to make as fast these areas were table given to make a fast the series of th

CARRIED OFF BY A LION.

Game Ranger Wolhuter, of the Transvani Government game reserves had on August 26 an extraordinary adventure with a lion, in which he showed erent bravery and presence of mind. The story is sent to the London Field, by Major J. S. Hamilton.

warden of the same reserves, and attested by the certificate of Mr. Alfred B. Peane. readout magistrate of the Barberton dis-trict. Size 19 1908 Epe Park Wollinter, who was returning to the Sabi from a patrol, tells the story in these

"I was riding along a Kaffir path about en hour after sunset; it had been a long march, and I had pushed on shead of the boys.' My dog barked at something and a moment later I saw a lion crouching close to me on the off side. I turned my horse sharply in the opposite direction, and this no doubt caused the lion to miss the

the region of th

artery or voin, as the blood poured over

setter of vote, as the blood power over met puper better of and serving. I me puper better of the puper be



NEW SEA-TO-SEA RECORD

Ahead of Schedule Time.

Run of More Than 3,200 Miles from New --- 1913

LOS ANGELES, Cat., Aug. 7.—The special train bearing Heary P. Low of the Despisering Company of America drew in at La Grande Station at 1:td o'clock this difference, having completed in run from the Atlantic to the Parific, a distance of move them 2,500 miles, in the factors time

Mr. Lowe let New York on Dwadny, at 120 h. N. And pariety in Let Angeles 10 h. Let A

:15 A. M. it was intended that the run to

CHICAGO, Aug. 7.-An official statemen of the remarkable run of the Lowe special over the Santa Fé was given out this even-

over the Banker PS was given and the special property of the p

2.2

RATED CARDS ons, Croutons and Other Delicacies

to Jackies. Bay to the New e came yesterday de-unique dinner given n the calisted men

ates ship Cutgon, on ord J. F. McFarlan, Cristo" of callsted

His Forty Trunks and Place Values.

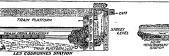
speciers Go Through Everything, While Provides Food, Defack and Dancing for Bridgeroom Louis Patience, but Eighl Hondred Friends and Dancing for Eight Hondred Friends and Darkers School Indigenous wave then formal to a be a supplied to the supplied of th

[SPECIAL DESPATCH TO THE HERALD.]

is the clustered area.

In the control of the contr

nd Where the Paris Disaster Occurred into time, as the finnes and write and write of the property of the prope



SEVENTY FIVE WERE FOUND DEAD B WHERE PASSENGERS WERE STOPPED BY SMOKE ented by means of a system of cable transmission that enables the reproduction on this side of a drawing made on the other side of the Atlantic.

or above diagram the late direction in which the processors rate [Comessure states from Belleville step and the controlled belleville step and the late of the state of the st

Obstves Twenty-Fifth Ami-versary of Marriage.

ever, necess was obtained to the stations FIRST DECLARATION REFUSED "MISERABLE FOR 23 YEARS" It was discovered that instead of the hor-

two trains travelling on the No. 2 line of Mrs. Michael is dead, yet that did not running from the McCopellian Underground Indiverse Market Is dead, yet that did not

whole sixteen carriages were a sheet of fire. The officials jumped on to the rails and fiel toward the station. They were

The electric wires were feeling and the tunnel, except for the flames from the

Thick amaka began to enter Mostleson tant station and also roll toward Les

While the two trains were burning, a train approached from the Père la Chaise station. The officials at Menilmontant warned the driver of the danger and he at once reversed his direction and went back as ouickly as possible, thus escaping with all the passengers, Penned In.

Meanwhile another train, No. 48, came up from Belleville behind the burning trains and stopped at Les Couronnes just as the smoke begun to enter the station from the tunnel.

Then the cuta-trophe happened. On roing the smoke the pussengers jumped

SIR WILLIAM HENRY PERKIN Oct of Coal Tar d Tar." who arrived Saturday/906 Seed. 21 on the Umbrin.

1906 SER ANDREW SOME IS HIS EXPORTED.

NY TYLDONC Nev 6 1912
TESTERDAY'S WRECK OF THE LEHIGH VALLEY'S BLACK DIAMOND EXPRESS ON THE MEADOW

NEW YORK HERALD, SUNDAY, OCTOBER 4, 1903.

#### NEW LOCOMOTIVE LARGEST IN THE WORLD

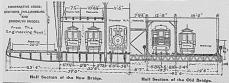


HEAVIERT & MORT POWEDFIE LOCOMOTIVE, IN THE WIDE D

Built at Baldwin Works for the Alchies of freight ongine that weighted 27, so the Son, Topeka and Santa Fe Railroad. The Son are the Son and the Son are the Son a

Purametrus, P., Saturday-Flatislus executes above, hwing correct the rails of these deconsers are being circum at the labelium with its powerful weight when it was including distinct Loronouter Works to the lactive; and extra lorony rails for this type of becomes better the contract of the latest l

#### CROSS SECTIONS OF OLD AND NEW BRIDGES COMPARED.



## German Electric Car Speeds at 127 Miles an Hour

Car on Experimental Line Exceed the Highest Record by a Kilometre.

Speed of 130 2-5 Miles an Hour. BERLIN, Oct. 23.—An electric car to-day, in the high speed experiments on the Ma-rienfolde-Zorsen line, attained the speed of 130 2-3 miles per hour.

TITE NEW YORK TIMES SHAPE ---

#### Christmas candies.

SCHRAFFT'S 'Ai' Box," Chocelates and Bombons, ½ lb., 30c.
1161b, 60c.; 2b. 10c.
1161b, 6

#### at handkerchief sale

ristmas gifts the handkerchief is the most popular, not only

nen's 75c and \$1 men's and women's hand embroid-effine French hand-ered linen initial handkerchiefs, edge and needle work.

ve given them unheard of Xmas prices to close them out.

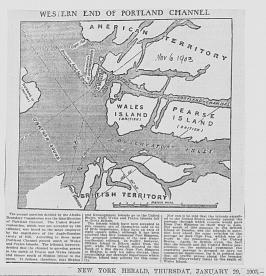
edge and needle work, an's \$1.25, \$1.50 and values—se a 50 n's lites, hand work of lace edged and French lace edged and French

e-half dozen of our ar \$2 values—in handkerchiefs, all choice styles. se French embroidered and novelty, real Duchesse and hand

## DESTROYED BY FIRE

ner Reaches Noted Place Just in Time to Save Lives.

NO SUCCESSOR TO PARKS.



## VENTY DEAD IN TRAIN DISASTER, NEW JI

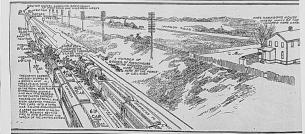
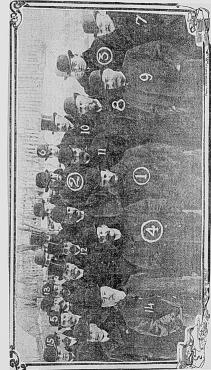


DIAGRAM OF THE SCENE OF THE ACCIDENT!



GROUP OF FAMOUS MILLIONAIRES WHO INSPECTED THE stearby was milliomered up in the Regular Turnets American American Conference of the American Conference of

## 'TECH' TOASTS IN LIQUID SUNSHINE

Alumni of Massachusetts Institute Er tertained with Radium at Their Annual Feast.

ELIHU ROOT IS PRAISED

Professor Pritchett Declares "No Man Since Washington Has Served His Country More Efficiently."

Their glasses charged with: 'bijuid 69m-shine,' and facing a banner helaid the lopatmaster which glowed with 'M. I. Z.,' guesta at the answal dinner of the Tech-nology Club, held in the University Club house last highl. rose in the dark and drank to their alma mater, the Massa-chusetts institute of Technology. Radium made the "liquid sunshine coci

Radium made the "liquid sunstrine code," at life 'building saint prepared by Lester D. Gardner illuminated the banner and later played a leading part in a series of experiments which were grouped under the filts of "liaving a Little Fun with Science." There was no attempt, the little for the little played to introduce the little played to the property of the little played to the littl

There was go attempt made to introduce any new wonders of radioactivity, but Mr. Gardiner had prepared a series of enter-taining demonstrations of what can be done with radium in the way of amus-ing speciators. The "liquid numbles," which was drunk without apported the turbance of the diners' digestive organs, turbance of the diseard dispersive organs was the nevel feature of a disnare which abounded in surprises. One of these was the maker mad flustering economies of the makers and disturbing economies. Printeletic lintroduced in the maker or a more address of the maker of the maker



PADRIC EFFECTS AT ENTERTAINMENT

AUTOMOBILE SHOW OFFERS NOVELTIES

Opens at the Crystal Palace and Attractive for the New Machines Shown.

THE KING'S MOTORS THEF

American and Was Constructed as a Pilot for a Coupe.

The Accordance in stage when the property and the property of the property of

NEW YORK HERALD, SUNDAY, FEBRUARY 14, 1904. 30

His Experiment Breaks Down His

W. T. STEAD'S PAPER TOO MUCH FOR HIM

The state of the s this period, and very pretty she tooked.

#### Edison Promises World More Electrical Marvels

Twenty-fifth Anniversary of the Perfecting of the Incandescent Lamp Finds "Wizard" Still Engaged in Harnessing Electricity.

HIS DESCRIPTION OF HIS FIRST INVENTION

Story of the Life and Wonderful Achievements of the Inventor Who Started Life as a Newsboy in the West.





knows little of and gives le things that might happen that roud which is carrying rafely. There are comofficers who are at all tir that no harm may come, w of trouble, should trouble need wreck is destructive cost of which is seldom the question of opening

> select a division of an east it need be but one hund the year two thousand frei

hauled from one terminu into a mass of rain, their iron bodies twisted, moves up, grouning At one end huge ships are their trucks torn off and denolished, turns over and falls well clear and out of At one end long ships are their frucks torn off and demoliabed, turns over and falls well clear and out of ing with open latches run some upole down, some our only others on the way, where it will remain until some receive the connecter of their shots. They have fallen both ways convenient time. A short green part of the short product is the short product by the short product pro pendent for tife upon the percey mosexer. Five numbers and may drown where the neares is cleared away, of fuel radning to them by tons of ead stand in the way of peoperss. The next car is lifted by the came and offeret clides are looking to all to be handled one shoveful at a time. Great edits are looking to all to be handled one showedful at a line. He frigid home for confirmation of the track as roboticy class formed the offerer dess. Billed bear described by the free of the state of the

Among railroad men the world over there must be completed within the shortest posis a superstition that wreeks come by threes, sible time and undertake their duty with that, if one occurs, two more will closely a will. that it one occurs, two more war closely a with.

follow. It is a fact that this situation has

The crane is run close up to the first debeen sufficiently illustrated to warrant the
railed car; its steam is up; rigging is made

en sometently moistrated to warrant the rather ear; he seam is up; rigging is made ding. Out of one hundred and ten in-ready for the first great lift. The tool-ear feeling. Out of one hundred and ten in-stances in one year of casualities upon tra-tions influonds, security of them ever planed fall in made fast on convenient rev, pur-in the order of threes, while upon twenty— strong enough to stand the required strain in the start of throce. While span teners, and the start of the start



Grand Duke Cyril Tells the Story of His Escape Pelopavlovsk. Scorched, Blinded, Choked and Stunned He Dived as Practised Swimmer and Rose

to See No Trace in Unruffled Sea of the Great

Heraid Battle Ship Petropaylovsk. all 20 1904

DALLE SIMP FELIOPATIVOUS AND ADMINISTRATION OF THE STATE OF THE STATE



THE WRECK-MASTER'S WORK.

or of its traffic, tended for them or their own warning to of the unfortunate engineer and fire While this work has been in progress, trains and block-stations comes too late, his never found, white this work has seen in progress. The dispatcher the victim of such a mis. 1 part of a railroad week nost to fortune can but order out the relief train, plored is the loss of human life. The events leading up to such disasters which, in remote cases, he has been known le of that merely comes the expendi-

are many. Sometimes train-dispatchers, to start on its way before an inevitable acci. I money and the slight detention of are many. cometimes transcriptions. Order to the suspense of moments. But men become injured and lose upon whom so much depends, make dent happened. The suspense of moments has been become injured and lose mistakes and collisions follow. Results spent under such conditions can scarcely lives in all trades and professions. from such causes are generally attended be described. Such a story is told of two al-life is no more invarious than with greater disaster, but are less frequent. trains that were once flying in opposite her. Train service exerts a certain

Men selected for such F trained before they are allowed to assume respon sibility. Their mistake when made, however, generally discovered i time. Of these the publi of course, never hears man is infallible, altho train-dispatchers are ve

the demilment.

nearly so. Frequently the linbility of disaster and to prevent it. Of this, too, the public never hears. At times the warning in-





ation, covered with mad, its cubin ed, its machinery stripped. int sounded in her last notes the deat!



let los sy led 10 rec mber 11 rec mber 11



#### America's Most Powerful High Speed Locomotive



May 2 1904 MOST POWERFUL HIGH SPEED LOCATOTIVE EVER BUILT

apred lecomotive ever built, tied New mountain elimber or as powerful as the in-York Centrary big Cole four cylinder, Alchibnors Western giants, but it could win with balance compound passenger recomstive from them any price for speed, and was what is now being tested on it the Meshaw divid- planned to drang a very heavy possenger into

#### Appalling Catastrophe at Andijan in Russian Turkestan.

Area of Disturbance Comprises Two Hundred Square Versts - 800 Corpses Already Recovered-Suffering Among the

Homeless. 1902

Monoletas (MD 2).

ABILINADA, limits revenues, bee; a consistency of the center reports of control to the center reports of control to the center reports of control to the center reports of the center reports of the center of

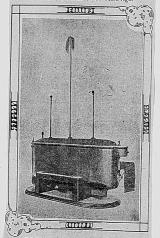


1956 SIR WILLIAM RAMSAY.
The English professor of chemistry. (Photo by Effect & Frs. London.)

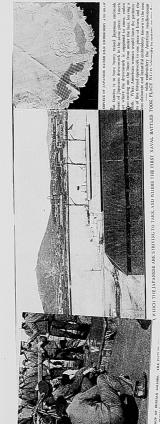
SATURDAY, FEBRUARY 13,

# DID JAPANESE USE 1904 WIRELESS TORPEDO?

Tesla Says He Gave the Details of His Invention to the Mikado's Men Three Years Ago.



Did This Torpedo Destroy Russia's Ships? otorpish of a torpedo invested by Nicola Teola in accordance with a princervered by him. It contains automatic propelling mechanicy and con an and to any distance and directed by virtuess electrical waves in any on and to any distance.





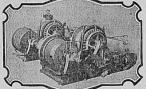
information of the state of the

Rush Orders Sent to America for Marine Railways for Use on Baltic Squadron.

SHIPS WILL START IN JUNE

They Will Be Accompanied by Colliers and Will Take On Coal No Matter

Principles because the nontrainty law minister of the principles o





Whose researches in the field of electricity and magnetism have resulted in practical operation of wireless telegraphy.



SIR GEORGE DARWIN . Junes harries Darwin and President of the British Association for the Advancement of Science. (Photo Copyrighted by Vander West, N. Y., 4628 1916

## HOTEL DARLINGTON COLLAPSES; 14 KILLE COMPLAINTS AGAINST SIMILAR BUILDING





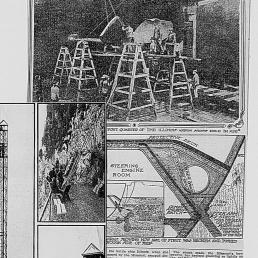
In sudden to the second second



THE SPOLIATION OF NIAGARA. Oct 1906

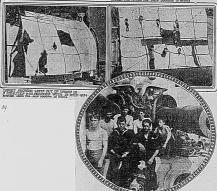


## Scars on the Illinois Seen in Dry Dock



NEW ELEVATOR UP THE SIDE OF THE BURGENSTOCK—HIGHEST IN THE WORLD.
It is 2,13 Fvet Above Sex Level and Overloon Lake Lucerne. (1) Upper Section of the Elevator, corne. (3) Dixty Flighe Leading to the Elevator.

Record of the Kearsarge's Big Guns on the Targets



CREW OF THE 13 INCH GUND

### STORY OF SHELLING OF PORT ARTHUR

Russian Officer Commanding a Battery Describes the Effect of Mek22 a Bombardment. 1904

counti"It was a clear, small day and there was a gends swell on the water. A little special properties of the state of the same and the state of t Bang! A shell burst under ner town, splashing the decks with spray. There, was another puff, and a projectile whis-tied overlead, crashing on the rock be-hind us. Then came a third. It was a moment of terrible suspense. There was a terribe explosion overhead. They had

set unsernette which and plunge of pro-jectiles and words of command were in-audible to the gunners. I tried vainly to shout my orders while 150 guns were

belching in a prolonged roar and shells were bursting overhead with a hellish crash. The smoke and dust blinded us. crash. The smoke and dust blinded us.
"I did not experience excitement, and
only that my teeth began to acho there
was a strange senantion of contentment,
amidst the scenes of death, which had
no terrors after the first shell had exploided. Suddenly a white faced games
pointed to a battery of quick firing mas
half way down the hill, which had been half way down the hill, which had been placed there to prevent a Japanese land-ing. I ran down and found the scene one of the wildest. There was a battle orgy of berst shells and whistling frag-ments, the smoke stench recking the

read.

"After the battle was over Lieutenaut General Stocooch, commander at Port Arthur, planed the Gross of St. George on my breast, But what does it matter—I am in the hospital."

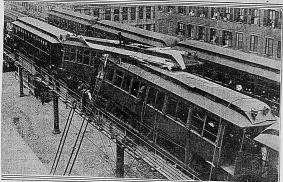
# NAVY'S HISTORY

So Rear Admiral Taylor Declares o the Record Made by the Kedrsarge.

REMARKABLE BIG GUN WORK

Six Hits Out of Seven Shots Made in Five Minutes and Twenty Seconds with 13-Inch Projectiles.

## vo Views of the Fatal Wreck on the Third Avenue Elevated Roc



WEREL WEN OF THE WRECK.

Motorman Killed in Collision on Third Avenue Line After Warning Passengers.

CARS WRECKED, HANG BURNING ON TRESTLE

ear Coach of Train Stopped Between Stations Is Telescoped and Several Are Hurt.

TRAFFIC IS BADLY BLOCKED

Crowds Jam Platforms and Surface Cars and Police Reserves Are Called Out

to Prevent Rioting. With a force which drove its first car three-markers of its inequit into a car three-markers of its inequit into a car three, a neath bound train on the Third state, the train of a state of the train a state of the train of

direction.

Thrown by the force of the collision from the rails, the two cars hung far out over the clevated structure and seemed to like the part of the that surface errs were not permitted to run below for an hour and a half literated.

mitted to run below for an hour and a half titerward,
Frank Hedley, general superintender
Frank Hedley, general superintender
that the interborough road, declares that
t could not have been possible that
be brakes refused to work. If anyhing went wrong with the machinery by



which the sector for the street or red of the ordinace of L was desired with a street of the ordinace of L was desired with a street of the st



HOW IS THIS FOR A BATTROAD ACCORDED



COL. WILLIAM C. GREENE.



PROF. CONRAD WILMELM ROENTGEN.

Illis discovery of the "X" or Roentgen rays has revealationized meeting practice and poved the way, to still greater discoveries practice in the field of light and electricity.



Who seted as electrical engineer for the Atlantic French-Atlantic Brazillan and River, the Worl Indian and the Nackyriteanett Atlantic cubic coverings period of years from 1884 to 58.

THOMAS ALVA EDISON.

With the commercial introduction of a radically new type of storage battery, public attention is again drawn to the man who has done more than any other in our time to apply electricity to the needs of every-day life. There is not an electrical instrument, or an electrical process now in use, but hears the mark of some great change wrought by the most ingenious of Americans.

Some brief account of Thomas A. Edison, as an inrentor and as a man, may not be without interest to the readers of a journal, many of whom are themselves inventors. To those who believe that Edison's work is the product of an inspiration given by nature to but few, the story of the manner in which he achieves success will seem shockingly unromantic. In the genius who works by inspiration Edison has no great faith. "Genius is two per cent inspiration and ninety-eight per cent perspiration," is the incisive, epigrammatic answer he once gave to a man who thought at a genius worked only when the spirit moved him. Yet it must not be supposed that Edison is deficient in imagination. Every great inventor must have some thing of the poet in him; for without a most lively fancy, he could never see the possibilities of his own

If the limits of this article permitted a discussion of Edison's numerous inventions, the characteristic of mercial utility would be found common to them all. Not being given to scientific rhapsoilles, Edison ies not concern himself with what may be of service a century hence; he confines himself rigorously to the

Knowing full well that he is probably not the first who has set for himself the task in the performance of which he is engaged, he reads all that is pertinent to his subject in the vast library which forms an important adjunct of his laboratory. Not content with the information gathered from his own shelves, his literary agent is ordered to send him more. If one were to examine a certain revolving bookcase in Edison's study at home, one could foretell what electrical problem is soon to be solved in the Orange laboratory for in that case are always contained the volumes which interest him most at the time.

After a thorough review of his subject, Edison begins laboratory work-an expert keemy alive to the failures of his predecessors, careful to avoid useless repetitions of old experiments. It is now that the two per cent inspiration gained by exhaustive reading, and ninety-eight per cent perspiration which he is ready to expend, are applied. Experiments are made; not a few, but hundreds and oven thousands. Model after model is built. Failure upon failure is met with, until further effort seems hopeless. Undismayed, Edi son performs more experiments, builds more models. Failure spurs him on. At last an experiment is performed or a model made which gives faint encourage ment. So far from being elated, he regards the promising result with great suspicion. The failures have been too many; the apparent success after all may be due to an accidental combination of circumstances that may never occur again. Only after the partial triumph has been confirmed by many trials does complete assurance

If ever an Edison invention was a product of infinite pains and unflagging pertinacity, it was the electric incandescent lamp. He had read all that could be read of the labors of others to provide a more efficient light. He knew of Starr's work in England and of Draper's in New York with the platinum wire. He had studied what Despretz had done with sticks of incandescencarbon contained in a glass globe exhausted of air and filled with nitrogen. He knew all that was worth knowing of illumination by means of incandescent carbon inclosed in a vacuum. Then he set his wits at work to find out why everyone had failed. Early in the spring of 1877 he began to experiment. First he thought that a carbon filament might be made out of cotton thread. Five hours were spent in carbonizing a thread. The frail black filament obtained crambled at the touch. Attempt after attempt proved hopeless. At last a carbonized thread was rescued intact from the furnace; and that, as had luck would have it, broke in the mounting. For days no further progress was made. He locked himself and his assistants in his laboratory, vowing that neither he nor they should open its doors until he had produced an operative incandescent lamp. After repeated mishaps and incessant testing, a lamp was completed which burned for days before its light expired. Then, and not until then, did he and his laboratory assistants rest. Every imaginable substance was now tried in the effort to devise a perfect filament-iridium, platinum and all the metals, threads rubbed with coal tar, plumbago, South American fibers, monkey-bast fiber, Mantla hemp, south American bast, whitewood, palm leaf,

suited his purpose. A man was dispatched to China and Japan with orders to test the native bumboos. or explored the Amazon for fibers, suffering untold hardships and tasting no meat for a hundred and sixteen days. A third was sent around the world, with instructions to search Ceylon in particular, from the north to the south and from the cast to the west. The whole globe was scoured. Finally the explorers brought back some eighty varieties of bamboo and three thousand specimens of vegetable fibers. Of all these, only three or four were found available.

Trial after trial was made to determine what shape of bulb should be adopted; what particular quality of glass should be used; what was the most effective way of exhausting the air, and what was the simplest method of scaling the bulb. And even after these tasks had been performed, it was necessary to devise a means of generating a current of the proper

In all this there is no guessing, no trusting to luck. Edison knows exactly what he wishes to accomplish, and how his end is to be attained. Absolute certainty of purpose and of method saves him from frittering away his time in useless experimentation. Chance has given perhaps an occasional idea, but it has not lightened his work. A device, whose invention he himself has attributed to arcident, is the phonograph. He had taken out a patent on a telegraph repeater, in which a chisel-shaped stylus indented a sheet of paper curled around a cylinder. These indented marks were to be used in retransmitting the recorded message. "White singing into the monthpiece of a telephone, the vibrations of the voice sent the fine metal point into my finger," he tells us, "That set me to thinking. If I could record the movements of the point and send it over the same surface afterward, I saw no reason why the thing would not talk. I tried the experiment first on a strip of telegraph paper. I shouted 'Hello!' hello!' into the athpiece, ran the paper back over the steel point. and heard a faint 'Hello! hello!' in return." Then he decided to make a talking-machine. The men in the laboratory laughed at him. In the end he proved

When the first operative phonograph was completed, Edison packed up his instrument and came to the office of the SCIENTIFIC AMERICAN. Without ceremony he placed the machine on the Editor's desk and turned the crank. The machine introduced itself. "Good morning," it said. "How do you do? How do you like the phonograph?" And thus it happened that the Editors of the SCHENTIFIC AMERICAN constituted the first public audience that ever listened to the phonograph

The story of the incandescent lamp is repeated in Edison's invention of a method of electro-magnetic cally concentrating ores. The system has been so fully described in these columns that a detailed description

is hardly necessary. About the latter part of 1897 Edison devoted his exclusive attention to the invention of a new storage battery, on which problem he had been engaged for some five years. For over a year he worked harder than a day laborer. He was at his laboratory at hair-past seven in the morning. His luncheon was sent to him. In the evening he left for dinner, but returned at eight. At half-past eleven at night his carriage called for him; but often the coachman had to wait for three or four hours until the inventor came out of his laboratory. Yet despite all this labor, no apparent progress was made for months.

When vacation time comes, and with it a chance to eave his laboratory, Edison plays just as he works, with his whole heart and sout. He will hear nothing of husiness. Science is thrown to the winds. Letters cent to him from the works are utterly disregarded Only a telegram of the most imperative nature will command his attention. And so it is with the little relaxation which he permits himself during his work. His hours of rest are few; yet his short sleep is sounder and more refreshing than that of many whos

enterprises are of less pith and moment. Of Edison's personality much might be written. When you meet him for the first time, you feel inmediately at your case—he is so unaffected and cordial. Then, if you are a newspaper man, you begin to study him out of the tail-of your eye. He is neither tall nor short, stout nor thin. His white hair makes him seem older than he really is; he is only fifty-six. His face is clean shaven—the mouth firm, the chin strong. In his dress he is careless to a degree. If you are for tunate enough to have him pilot you through his labor ntory, you will find it no easy matter to keep up with his quick step. He is nervously active; everything he does is done quickly, yet not hastily. He explains things tersely and clearly. You talk to him; you notice that he is somewhat deaf, and you wonder why this man of all men, should not resort to some invennemp. John American 1988, waters one, page 4 sum man of eath mea, smooth not renor to some inven-paper of all kinds, jute, cardboard, humboo, and a host tion that will enable him to hear better. But he looks of other substances. After thousands of the substance of the substances and as a mistortune. Emineral threads had been tried, it was finally determined that specialists have told him that he can be cured; but he regetable fibers produced the nest numerats.

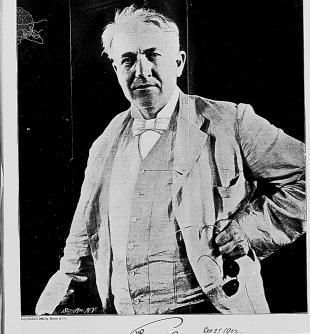
He had now to determine what regetable fiber best arguing shrewdly that if he could hear the noises

which have been so long muffed, he might find it modifficult to concentrate his mind on his work Some day a patient Boswell will lovingly intersper

in the chronicle of Edison's life-work many a tale his delicate sense of human. If there is one thing the Edison loves, it is a rollicking story. Many a blac hour in the laboratory has been brightened for hi ants by his keen wit and sparkling repartee. C sionally the outer world hears his scientific opinion expressed in some playful surcusm. When asked on by a New York State official what was the best method of electrocuting murderers, he gave vent to his derooted opposition to capital punishment in the bant ing retort, "Hire out your criminals as linemen to th New York electric lighting companies," Then he beg an exhaustive investigation which finally revenied quickest and most paintess method of ele-Every man in the laboratory who hears a good joke o wer remark feels it his duty to repeat it to the "Old Man," as Edison is affectionately called in the

His laboratory and his plant are not so much a place of business as a school of scientific invention, of which he is the master. Indeed, he has ideas of busin which a Wall sareet man might charitably call ecces trie. Nowada) his business affairs are conducted t able men. But in the days when he built his first plan at Newark, and when the actual work of keeping accoun devolved partly on him, he conducted his financial affairs in a picturesque, nonchalant way. "I kept only pay-roll accounts, no others," he assures us; "receive the bills, and generally gave notes in payment. The first intimation that a note was due was the proteafter which I had to hustle around and raise th money. This saved the humbuggery of bookkeepin which I never understood. The arrangement, besides possessed the advantage of being cheaper, as the p test fees were only one dollar and a half. Notwithstanding this extraordinary method of doing busine everyone was willing to accept the notes and my credi was good." The hours of work were just as creation "We had no fixed hours, but the men, so far from obwe man no used nours, but the men, so far from ob-jecting to the irregularity, often begged to return and complete certain experiments, upon which they knew my heart was especially set."

Like all successful men, Edison has his en He has been accused of appropriating the work of others as his own. There is a rumor abroad that h employs a number of brilliant young men, whom he pays handsomely to work out his ideas, and that it i they who really ought to be credited with the inventic of many devices that bear his name. That he is depen dent to a certain extent upon the help of assistants i undoubtedly true. Nature has given him but a single pair of hands and a single head. In his laboratory the help which he receives consists largely in the per formance of tasks too multifarious for a single man Something more than a bare idea to work with is given to each man in the laboratory. He is told exactly how the result desired is to be attained. In other w the men in the laboratory are intelligent human tools in Edison's hands. To him alone is due the inveontrivances with which his name tion of the many will ever be associated.



## WIZARD EDISONMENACES WITH PRISON THE MEN WHO USED HIS SON'S NAME

## "I WILL SPEND MY LAST DOLLAR," HE DECLARES.

"My Boy Was Misled, and They Did Everything Except Make a Criminal of Him. 1 Must Protect My Name"

The Monastery, Stewartsville, N. J., Oct.
5.—Thomas A. Edillon told a reporter for
the "AMBRICAN" to-slight that he would
presente criminally any further effects of
men who use the name of his son, Thomas
A. Edison, Jr., in the magnet deciric battery scheme or any other venture.

"I am doing that which any good father
would do." be stated, "that which any

Sickness Soizes Wizard. The Winned of Memio Park was found to-ght at a little house situated in the nemy recesses of the great hills near





Marie Touhey, former Casino Chorus Girl, Who Became the Wife of the

And the continue was a second to be a second to be

From some of the state of their continuous control of the state of the





AN AERIAL FLIGHT

# TELLS AROUT

W. Bennington's Story of How the Chemical Company Was Organized.

HE PUT MONEY IN LATER

Invested \$25,000 When He Saw that a Number of Good Men Were Having a Hard Time.

CONCERN NEVER MADE A CENT

Took In, He Declares, About \$100.-000. But Paid It All Out in Expenses-Gloom at Office.

Throughout the financial district to-day men were discussing the strange associa-tion of Franklin Everhart William Newton Bennington, and Thomas A. Edison, Jr., in the chemical company, against which a fraud order was issued yester-day by the Post Office Department. There was unmistakable gloom in the offices of the Thomas A. Edison, Jr., Chemical Company at 14 Stone street and a tendency among those who held the fort there to shift responsibility for the methods which the government found it necessary to

check,
Out in West Grange Thomas A Educawas jubilant. He said that he felt years younger and was sure that his son would never again yield to men who stood for nothing sound in the business world. Frank L. yer, counsel for Mr. Edison,

"I am greatly gratified at the outcome of the case. After three months of labor in preparing it, I could see no other result in sight. I have assurances from young Mr. Edison that he sees the error of his way, and will under no circustances listen to business propositions which in-volve the use of the family name.

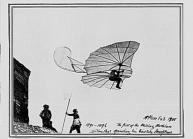
W. Newton Bennington was very nerr-ous when seen to-day, and was anxious to have it understood that he had nothing to do with the organization of the com-"Franklin Everhart and my brother W L. Bennington organized this company," and be. "They made the contract with young Edison. I have only been with the company for eighteen months. I put \$25,-000 in the business when I saw that a number of good men were having a hard time of it

"This company has never made a cent.
It has taken in about \$100,000 from the
sale of 7,000 'vitalizers.' There wouldn't
be a nightel left in the treasury if all our expenses were paid.
"The different parts of the 'vitalizer'

"The different parts of the 'Irialize' were made by several concerns, but the apparatus were assembled in our rooms upstairs. We never told customers tinct we had a laboratory in Contre street and is Orange. A Newark laboratory was mentiosed. I understand that young Edison lived with his uncle there, and had a workshop in the house.



THOMAS A EDISON Who procured a fraud order against the Thomas A. Edison. Jr., Chemical Con



#### \$7,000,000 T Here for

Members of English Soci Will See That This pended-Chicago

#### e in Complete Operation

### THE FIRST LOCOMOTIVE



Entwistle Engineer on first English Locomotive

the control of the co

15



NEW YORK CENTRAL 93-TON ELECTRIC LOCOMOTIVE NO. 6000.





AFTER THE EARTHQUAKE IN CALABRIA, ITALY. 02/1906
The steeple of the church at Tregen was so budly demaged that it was found accessor; to pull it deem.





82





A CASE OF RAREFYING OSTEITIS. (No History Obtainable)

By DR. W. J. HERDMAN, Ann Arbor, Mich. Jan 1905

A Oable Indiread.

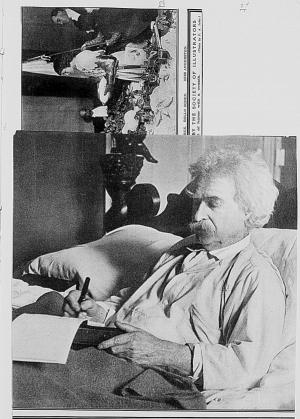
The cars shown were a part of a first of shows than 20 cars, each loaded with about 20 cass of cost. The trait, a double header, or, in other words, drawn by two becomes two first of the Long Creek grade and leagun the descent when the ar brake reduced to word. By the time the hand brakes were applied the train was considered to the contract of this grade a contract of the contract of the grade of the contract of the contra the collision occurred. At the bottom of this grade a bridge spans New River, connecting the Loup Creek branch with the main line of the Chesapenke & Ohio on the north side of the river. Standing on this bridge was a long



trill of leaded coal cars with a pusher locomotive at the zone decoders when the coal cars with a pusher location of the pusher hearing the runnway train both ends the trip the large through the runnway train both ends the trip the large through the pusher was strate by the two locomotives at like locomotive was strate by the two locomotives. It is completely wrecked, as was also a wooden lost or immediately in the rear of the two runnway locomotives remained the pusher location of the rear of the two runnway locomotives remained to the rear of the two runnway locomotives.

The only other break in the runaway (rain was that shown in the pleture.)

Between these two cars were three loaded wooden cond lars. The force of the collision drove the cur shown at the left of the pleture up and over the wooden cars com-pletely demolishing them. The curs back of this point all of them built of steel were percletally uninjured. When the car shown at the right of the pleture was pulled When the car shown at the right of the pleture was pulled away by the wrecking crew it was found that the wreck-age of the three wooden cars was so tightly jammed un-der the other car that it was not only mastle, but almost impossible to remove it, and the car had to be thrown over on its side.



Mark Twain does his writing in bed

Jun 14 1906



HURRY AND HUSTLE THE BASIS OF MODERN LIFE, SAYS THE INVENTOR

A long, high walled room, p wainscoted with light wood; e neled and I wish you could have seen the faces of A month of the state of the sta

real. That is the recognists recomb opposition by the proposition of the bobbonists are updated from the proposition of the proposit helps to this appearance of abstractic infine "I am working at present on the in-battery for automobiles. My idee mot make it possible for a tenneau car I make it possible for a tonneau car f

persons to go without reoherging of to hundred miles. We can do that not heavy trucks, but the motor is too for the auto for traveling. The pr limit at present is fifty miles for the neau."

"And you will limit the distance f perfected auto of the future to a hu

perfected onto of the future to a bit.

"There is an just to earpfling it was a bit of the second of the future subject of the futur

tion from the scientific into the person "Last Sanday I was near Plainfield

\*New York! It is the enitome of the horror \*You take the case of locomotives they Tot take (no case of incommerce; tasy appear alike, they have the same measurements, to all intents and purposes they are alike and yet one of the two will be far better than the other, and no one can tell feature. Its has but the one rede better than the other, and no one can tell feature, that it is getting so may



"AN INVENTOR SHOULD BE A BULLDOG WITH A POETIC ATTACHMENT.

seed I have worked thirty-due years on its pleasurgate. It is according to the production of the pleasurgate. It is according to the production of the pleasurgate. It is according to the production of the pleasurgate. It is also improve the exactly the production of the pleasurgate. It is also improve the exactly the production of the pleasurgate. It is also improve the exactly the production of the produ in the morning until 10 at night, but I am shut out from the world, the work is inter-esting, there is note of the terrible strain

that comes to the man in the city.

"It is languation that makes the poet;
it is in imagination that makes the poet;
it is inagination that makes the inventor,
for the dream preceded the work; the result,
the city. It is not the compared the compared to the city of the compared to the city of that come to the man in the city

"The longest time I ever worked con tine longest time I ever worse con-tinuously was five days and five nights without sleep. That was during some of the lighting experiments. Once I worked the lighting experiments. Once I worked four days and four night—that was just before the opening of the Pearl street sta-tion. We did not know what was going to happen; we expected something would exploid when we turned on the current. Everybody said it was going to be a failure, When we turned on the current, however it started all right, without a hitch, and ran

it started all right, without a hitch, and ran for eight years.

What effect does the loss of sleep have?

What effect does be loss of sleep have?

What effect does be loss of sleep have?

What effect does not have a started and the does not have and the does not have and feel absolutely no fill effects from my long work. I believe that people as a general thing sleep too much; three or four hours are consept. It is is good told sleep, hours are consept. It is seen told sleep, and the sleep have been people that about 24. A man caume to me once talk about it h. A man came to me once-couldn't sleet was troubled with insomnia and was terrabled with insomnia and was terrabled. I said 'I'll cure



will be fifty-nine years old (or young) early in Feb-ruary-the electrical wizard is quite as old as he looks, though hardly as ancient as he ingeniously

Ninety-eight? Nothing the incredulous tone in which the trespassor on his time repeated the numeral, the fine gray eyes twinkled humorously and a chuckle was scarcely suppressed as he explained that he had labored eighteen hours a day on an average since he was twenty years of ago, or about twice as much work as the ordinary man puis into twice as much work as the ordinary man puts into a day. For an eight-hear day is not long enough to compass the extraordinary energy of this premier American, who, from turning night into day in respect to his working hours, has slone the same than for the electric-lighted world. His has not been a

for the electric-lighted world. His has not been a union schedule.

Dwelling one more paragraph on the subject, it may be added that he reckons his own age by still another and more favored method—by the epochs in his life rather than by the coming of the anniversa-

standing in the big front hall of the West Orange home when he humorously made the foregoing reck-oning. Arresting the giance on every hand were all oning. Arresting the glance on every hand were all the comforts of home and most of the luxuries. A general impression of the Edison home may be con-densed in a phrase—every comfort in it is a luxury and every luxury is a comfort. This main hall, like the remainder of the big gabled mansion, contained no garish suggestion of wealth. It opened into a dining room so large around that it appeared low and so generously windowed that the frosty morning and so generously shadow within. Also opening on the hall was an ample drawing room which violated the hall was an ample drawing room which violated all drawing-room traditions in that it contained we-eral energetic phonographs hearnely fulfilling their mission. We were leaving the house for the labora-tory after the famous worker of wonders had spent the entire night over some new problems. He had snatched perhaps five hours of sleep, had partaken of a frugal breakfast, and was now starting back to the workshops under the hill. What. Co. & the prob-

foolishness to express hopen when all the world wants or is concerned in are results."
"Is it true that you are in hope of solvi problem of perpetual metion?" 'Absurd! absurd! Pernetual motion to science

"Absurd! absurd! Perpetual motion to science and the discovery of the north pole to the world bear what we might call corresponding relations. When some scientist finds time hanging heavy on his hands he may turn his attention to perpetual motion. But meanwhile there are far more vital and immediate discoveries to be made."

"For example?"
"Well, the control of the energy stored in cont. di-"well, the control of the energy stored in coal, directly and without maste," replied Mr. Kalson, "Is it a possibility? Yes, it is not only possible but probable of discovery. Some day soon it will be done." The well-modulated voice went almost to a whisper. One hand chaded and partially supported the broad, domed forehead, the other rested on the arm of the chair. The keen eyes were curtained as by a phantom vell, and his whole flamer became oy a phantom vell, and his whole learner become one of processing his his his processing about a taken the continued, as though thinking about a tremendour in heat from the chimneys and in his heat from the chimneys and in heat from the chimneys and in his heat from the chimneys and in his heat for the chimneys and the chimneys and the chimneys and the chimneys are chimneys and the chimneys and the chimneys are chimneys are chimneys and the chimneys are chimneys are chimneys and the chimneys are chimneys are chimneys and the chimneys are chimneys are chimneys are chimneys are chimneys and the chimneys are chimneys and the chimneys are chim

### THOMAS A. E

This auggesting practiculities, the general improvidence of inventors Did material-businers-ability neces

Did material-businers-ability nece with the inventive faculty? The great face under a mane of wrinkled with swift humor. A re-caused him foy had come to him, and crail years ago, on starting out, or in, factory was in Newark. I of course. factory was in Newark. I, of course, t keeper, because everybedy said that to do. At the end of the year the b up a statment and displayed it to me the items we had cleared some \$8, twelve months. It really made me invited all hands to diener and ble

first-class style.
"Then I began to think over the seemed to be something wrong somes not know where. So I set to work it accounts, spent several nights at 'it, who was up in such things to help z in just as though it were an insurance

Again came the hearty chuckle, w he continued: "Well, when we final counts untangled I found that, to

sy have the same measure-ents and purposes they are no of the two will be far though on the perfection of the

THE SUN, SUNDAY, MAY 14, 19

Torki it is the epitome of the horror age. I hate it. I leathe its artifical I living, its mannerisms, its ways of it. It has but the one redeeming that it is getting so mpossible ork! it is the epitome of the horro that people must leave it or become crazy.

\*A man in New York gots down to his of



TOR SHOULD BE A BULLDOG WITH A POETIC ATTACHMENT.

I decremed incidentally a fee at 9, works until it or 1, goes out, takes complete for execution and complete for cedentals, such as hearty limits research and out of the complete for execution of the complete for exe

and finally tumbles into bed. It is that type of man who often eave to me, I don't see how you stand the strain of working the way you do day after day, and night, after night in the laboratory. World Why, my work is play compared with his, and yet I am here on an average from 8 in the morning until 10 at night, but I am shot out from the world, the work is interesting, there is note of the torrible strain.

"It is imagination that makes the poet; it is imagination that makes the inventor, for the dream precedes the work, the result, the effort. Just as the writer thinks of his plot and makes his characters work it out, so the inventor labors toward something which is already perfect in his mind. Any man can become an inventor if he has im-agination and pertinacity; an inventor is simply a buildog with a poetic attachment,

The longest time I ever worked con-tinuously was five days and five nights without sloop. That was during some of the lighting experiments. Once I worked to the lighting experiments. Once I worked control the connecting of the Pearl street sta-tion. We did not know what was going to happen; we expected combining would explaid when we turned on the current. Everybody and it was going to a failure, When we turned on the current, however, it started all right, without a hitch, and rar

for eight years.
"What effect does the loss of sleep have The second process of the process of



which the trespassor on his time repeated the nu-

meral, the fine gray eyes twinkled humorously and a chuckle was scarcely suppressed as he explained that he had labored eighteen hours a day on an aver age since he was twenty years of age, or about

twice as much work as the ordinary man puts into day. For an eight-hour day is not long enough to compass the extraordinary energy of this premier American, who, from turning night into day in re-spect to his working hours, has done the same thing for the electric-lighted world. His has not been a

may be added that he reckons his own age by still

another and more favored method—by the epochs in his life rather than by the coming of the anniversa-

He whose name is as familiar as electricity was standing in the big front hall of the West Orange

home when he humorously made the foregoing reck-oning. Arresting the glance on every hand were all the comforts of home and most of the luxuries. A

general impression of the Edison home may be con-densed in a phrase-every comfort in it is a luxury

densed in a phrase—every confort in it is a inxiry and every luxury in a comfort. This main hall, like the remainder of the big gabled mansion, contained no garish suggestion of wealth. It opened into a dining room so large around that it appeared low and so generously windowed that the frosty morning

ann routed every shadow within. Also opening on the hall was an ample drawing room which violated

all drawing-room traditions in that it contained sev-

all drawing-room traditions in that it contains a eral energetic phonographs hearsely fulfilling their mission. We were leaving the house for the labora-

tory after the famous worker of wonders had spent the entire night over some new problems. He had snatched perhaps five hours of sleep, had partaken of a frugal breakfast, and was now starting back to Three Jan 7 1906

wants or is concerned in are results."
"Is it true that you are in hope of solving the problem of perpetual metion?"

protein of perpetual motion?"
"Aburd!, aburd! Perpetual motion to science
and the discovery of the north pole to the world
bear what we might call corresponding relations.
When some scientist finds time hanging heavy on
his hands he may turn his attention to perpetual
motion. But meanwhile there are far more vital and immediate discoveries to be made."
"For example?"

" For example :"
" Well, the control of the energy stored in cont, di-"Well, the control of the energy store, in con, un-rectly and without waste," replied Mr. Ediron. "Is it a possibility? Yes, it is not only possible but probable of discovery. Some day soon it will be done." The well-modulated voice went aimost to a whisper. One hand ehaded and partially supported the broad, domed forchead, the other rested on the arm of the chair. The keen eyes were curtained as by a phantom vell, and his whole ranner became by a phantom vell, and his whole ranner became one of preoccupation. Presently 1 continued, as though thinking aloud rather that one: "Ninety per cent, of the entry is now lost. That is a treemindor in heat from the chimneys and the continue of the conti THOMAS A. EDISON

This suggesting practicalities, the general improvidence of inventors Did material—businers—ability necessarily interfere

own maxwal-mounter-achilty necessive the interview faculty?

Within the Investment of the Investment o

Invited all hands to disner and bld

flari-class style.

"Then'l began it histo over banatier. There

"Then'l began it histo over banatier. There

"Then'l began thing eveng some period.

The style of the style of the style of the style over the s

made, and no ernsures are in evidence. Here and there the word

HURRAHI stands out hand-printed on a page. A particularly veciferous exclamation appears directly under a mi-nute record of the various stages of progress in the quadruplex system of telegraphy.

Even more frequent, however, are the appearances of the tallsmanic letters

N. G. at the end of a notation. Whenever an item bears these letters for a nunctuation, no subsequent mention of the item is on record. As a precautionary measure, each page of the several volumes is dated and the date attested by three witnesses chosen from

among his confidential assistants. Whenever, as has happened on various occasions, a lawsuit is brought against or by Thomas A. Edison, his notebooks have been of invaluable assistance—his best witnesses and sturdlest documents in evidence. One of the most interesting passages in the note

books sets forth in detail the Alphn and Omega of the Edison incandered light, which, as the world now

MR.EDISON IN HIS LIBRARY On the Eve of His 59th Birth-

day Tells What It Will Mean to the World if a Method of Saving the 90 Per Cent. Waste in Coal Consumption Can Be Devised. & & &

creased the current, yet the frail thread remained intact. Then, with characteristic impetuosity, and marveling at the power of the filame.i., the full power of the machine was turned on and the cons-

quences cagerly watched.

For a minute or so the slender thread scemed to struggle with the intense heat passing through itstruggle with the Intense heat passing through its-heat that would melt a diamond itself-autilit is sec-cumbed. Night and day, with scarcely rest enough to eat and sleep, the inventor continued his experi-ments. From carbonizing plees of thread he went to ephinters of wood, straw, and then paper. As a sample of the notations which appear in these wonderful dram boods, the following items

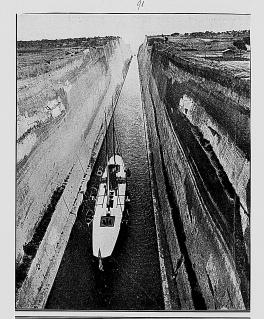
these wonderful dream books, the following items by taken:
may be taken:
may be taken:
considered the following th

and form of cell which is best to work by induc tion. It may be a primary of 20,000 Dhms. R, and a secondary of 10,000 Dhms. will work with very 

At least fifty notebooks deal with the phonograph, which remains a pet invention of its creator. Thus singe by singe and page by page the genius of Thomas A. Edison is curiously recorded, a genius which is half patient painstaking and half common sense, nor is it in any way speoky as revealed in these beautifully written diaries. Asked if the many "N. Ga." which star or mar the pages represented a waste of time, the Columbus of chemistry began

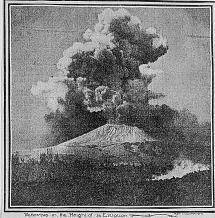
ante of time, the Columbus or chemistry i muring something about the sings. Him who sings. To one clear harp in divers tones, That men may rise on stepping stones. Of their dead selves to higher things— yords which meant the same.



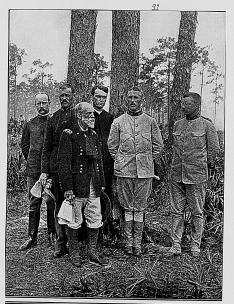


J. PIERPONT MORGAN'S YACHT "CORSAIR" PASSING THROUGH THE CORINTH GANAL, GREECE 1/06 Mand.

CRATER OF VESUVIUS POURING FORTH FLAME, LAVA AND SMOKE



7



GENERAL JOSEPH WHEELER WITH COLONEL LEONARD WOOD AND LIEUT. COL. ROOSEVELT AT TAMPA-Behind General Wheeler, Major Dunn, Lieut. Col. Brodie and Chaplain Brown.

the heroism of the selder who fights to the end and dies rather than surrender, of the sailor who stays in the senking ship so that a passenger can be saved, of the physician or the nurse who remains in a plague-rid-den city, of the fireman or the policeman who re-gards it as no more than his duty to imperil his

gards it as no more than his duty to imperil his own life it others are in need of ud.

But of all forms of heroism, surely that of the man who faces death in a dozen different ways, not for a momant or a minute or an hour, but hour after hour and day after day, is the highest. On after hour and day after day, is the highest. On such a man the eyes of the world have been turned during the past week. Prof. R. V. Matteuecl, the Director of the Royal Observator on Mount Venuvius, has remained at his post throughout the cruption of the volcano, the most awful outbreak of Veauvius since that in A. D. 70, when Pompei

and Herculaneum were destroyed.

He has stayed there, in the rules of the observetory, carly wrecked by the hot askes thrown from the crater of the volcano. His friends implored him to save himself, but he believed that during this to save himset, but he believed that during this certible time, if at any time at all, his duty de-manded that he remain—that he could be of real help to the many thousands of people living near the volcane by warning them when further peril was impeading, and by reassuring them when the volcano began to show signs of having spent its

. 23 23 23

And in this belief he has been justified. On Ruesday and Wednesday, when the situation was such that even in Naples there was a veritable panic, when the people believed that the city was about to be blotted out, when the prisoners in the fall mutinied, and the poorer classes, declaring that the authorities were to blame for the loss of many lives, were in the mood for any excess, it was the messages from Matteucci that furnished the one note of hope. It is, indeed, more than probable and averted a terrible outbreak on the part of the population.

The knowledge that this man in the midst of

peril far greater, indescribably greater than that of any inhabitant of Naples, remained cool and full of faith that conditions were about to grow brighter, must surely have served to caim the fears of thou-

"If my words," said Matteucel on Wednesday morning, "could influence the population, they would be words of encouragement and sympathy, for I am most confident that Vesuvius will soon return to its normal conditions."

When this message was sent the outbreak was at its height, and the situation of Matteucci and of the half dozen carbineers who shared his peril in the ruins of the observatory cannot even be imagined. We know that enormous masses of stone were being ejected from the crater; that lava was coursing down the mountain side, destroying everything in its path; that even at Naples the ashes covered everything like a snowstorm, and that the "scoriac," as the smaller stones are called, to distinguish them from the larger stones, which are called "bombs," were falling as far away as Capri. What must have been the situation a mile and a half from the centre of the crater?

23 23 23 But, whatever happened, it was not sufficient to upset Matteucci's nerve. On Friday, as soon as it became evident that his prediction had been accu-rate and that the volcane was considerably calmer, he set out from the observatory, not for Naples to

#### Professor Matteucci, Whose Defiance of the and Encouraging Messages Saved Naple

get some rest after his frightful experience, but—up toward the crater! "At the imminent risk of his own life," said the dispatches, which seems superfluous. It was no daredovil trip that he undertook, simply It was no daredovil trip that he undertook, simply to go where no one else would dream of venturing. His journey toward the crater served still further to quiet the alarm of the populace, for Matteuerd found that, unless the conditions changed radically, there would be no further discharge of law. He ascertained that the come of the volcano had diminished considerably in height and the showers of cinders thrown out had been transformed into ashes, and therefore he believed the end of the great disturb-

The same day Matteucci sent another comforting message to Naples. He said:

"Very little is known of the volcanic forces, so one can never safely predict what is going to happen, But I think I can with some confidence express the hope, based on my experience here, that the explosive period of the cruption has passed. It is impossible to make a positive statement to this effect, but the probabilities point to a quieting down of the volcano.

This however, does not mean that its activity will en-

"Until the crater definitely assumes its new share -that is to say, when the ridges have been smoothed down-there is a possibility of further disturbances. For the present the light wind blowing will, in all probability, carry the ashes in a direction which will leave Naples free from further annoyance of this nature, and as it is, the ill wind is blowing good to other places, for ashes are the best fertilizer it is possible to use. It is merely a question just now of having too much of a good thing." 23 23 23

Six years ago the selentific world was startled by reading that an observer had camped for three days on the odego of the crater of Vessurius while the violeane was in violent cruption. At that time the boiling lava was within 200 feet of the top of the crater, enormous blocks of stose were thrown out, and grart quantities of the scorias. The obout, and great quantities of the scorine. The observer who camped on the edge of the cratter was Prof. Matteucci, who had then been Director of the Royal Observatory for four years.

The details later received regarding the proceedings of the professor only nerved to increase the general wonder at his intropidity. It was related

how, on one occusion, when he was camping, not on the edge of the crater, but on the mountainside sume distance below, the volcano threw up a block of stone of extraordinary size. It rose in the air and came down within a few yards of Mattoucel. and came down within a few yards of sistenced.
What was Matteucoi doing in the meanwhile?
Running away as fast as his legs could carry him?
No. He was standing with a stop-watch in his hand, carefully counting the seconds during which the great mass of stone remained in the air, It was up seventeen seconds, and, by weighing the stone afterward and going into various claborate com-putations, Matteucci was able to announce that the

stone, which had trayeled at the rate of 300 feet a second, had been ejected from the volcano with a force equaling 607,603 horse power.

A man who could do this could do anything, and perhaps he has been reckoning the horse power within Vesuvius which has been behind the outbreak of last week,

Matteucel has had three famous predecessors in the observatory, all of whom displayed heroism when the volcano was in cruption. The first Direc-tor was the great Melloni, who died in 1854. It was he who suggested to the Neapolitan Government the advisability of creeting an observatory on Mount Yesuvius, and pointed out the most suitable site

for such an institution—a ridge 1,005 feet above t level of the sea and not far from the crater, wheas sufficiently high to divide, except under transfulary conditions, a stream of lava from

Melloni's suggestions were adopted, and servatory was established in 1841. Melloni v pointed Director and remnined at his post eral years, but then the Italian reve troubles broke out, and Melloni, who was revolutionist, was forced to flee from t The observatory was closed for a long 1800 it was responed under the control oversity and has remained open over rangement is that the Professor of



ice at the university is also Direc

Observatory.
The first holder of the combin Palmieri. He remained at the cout the great eruption of 1872. were not then utterly destroyed hardly short of miruculous. E and the lava flowed so close to i unlike Matteucci during list w empletely out off from comm

human beings.

It was in the cruption of 1872 It was in the cruption of 1872 of lava issued from the Atrio de suddenness as to overtake and b of a crowd of spectators who ha watch the spectacle, while others; stones ejected from the cruter. A the observatory is a slab on which is memory of those who perished.

Prof. Paimierl was succeeded by Pro and he in turn was succeeded by Prof. Mr

BOOKER WASHINGTON AND SOME OF HIS DISTINGUISHED GUESTS.

Print bit is the form of the control of



PROF. JOHN WILLIAM BURGESS.



Sep 80 1976 PROF. J. J. THOMSON

"All the News That's 106 Fit to Print."

VOL. LV...NO. 17.61

## **MATTEUCCI TELLS** OF THE ERUPTION

Stone Blocks Rose to a Height of 2.500 Feet.

GREAT ELECTRIC DISPLAY Scientist Thinks It the

Feature of the Outbreak.

AMERICAN SHARED PERIL

Perret Remained at the Observatory-Volcano Exploded While Matteucci Was Interviewed.

through which he had gassed, he is of our warrance, remains indicate, baryon founds, with professional continuation of the professional continuation and the professional continuation. His appearance combines and professional continuation of the indicatability of the savest and scene. Some of these have been continued to the indicatability of the savest and scene. Some of these have been considered to the professional continuation of the professional continua

"Throughout Sunday," he continued, "enormous solld blocks of atome rose to a height of 2,500 feet from the cra-fer, while anheas and sand were thrown much higher, but toward Monday the terrible shocks of carthquako grad-ually diminished. One of the worst features of the cruption was the un-features of the cruption was the unfeatures of the oraption was the unusual extent of the electrical phenomena, the darkness being broken by vivid
blooditic color, with alert, heavy peals
of thunder interspersed. These moments were torrible—very terrible. Yes,
many terrible—very terrible. Yes,
and yisided valuable results. Prof. Mattescel replied;
"Observation was extremely diffi"Observation was extremely diffi"Observation was extremely diffi-

"Observation was extremely diffi-cult under such disturbing conditions. The setsmic instruments were badly at-fected by the electrical intensity, each explosion being announced by a vio-lent movement of the instruments, which seemed roady to burst into

pleces."
Prof. Matteucel sounded a long, rasping "R" like a succession of quick taps on a drum, which, be said, resembled the noise made by the seismograph when affected by a violent explosion.
"Compared with other great crup-While Mattencid Was later with the selection much by the selection was later with the provided and the provi



JOHN W. GATES. 243 daring and successful flumcial operator. Nature's interest is chelefy in railroads, but his venturesome disposition neglects.



HON, T. P. O'CONNOR,

#### THE EVENING POST: NEW YORK, TUESDAY, MAY 1, 1906.

### AMID SHOCK AND FIRE

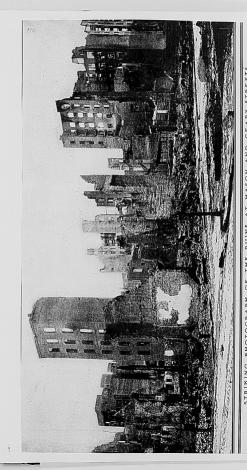
Personal Experiences of Alfred Holman, Editor of the Sacramento "Union." Who Went Through the

The following parametal experiences in the control of the parameters of the paramete

sary to nick one's way through dibris over a child's cart mon which a few domesti a good part of the distance, making the essentials were tied in all this moticy and walk both tedious and at places danger—pitiful procession nothing more directly anwere vertien for the Bernmania Union momes and were gathered in the middle of and little cone to piece of safety. It was by Alfred Molama, the oldier of the paper, the direction, many of thom as they came of the safety, indiced, tered the heart, for there.

3r. Holman is one of the abbast and best from their bods, wrapped in bianteers and was no aspect of it which did not tell of known newspaper writers on the Parish window droptes. The present newment (see-re and pain,

newer and more modern buildings stood the top of a dirt wagon. I saw the venthe shock, while older buildings, both of erable Judge McFarland, with his aged brick and word, had yielded. It was noceswife on his arm, limping past, dragging See The Presentant Discourse of the Mark Collins and at Juden design, and the Presentant Collins Trained and discourse presentant of the Collins and the Colli



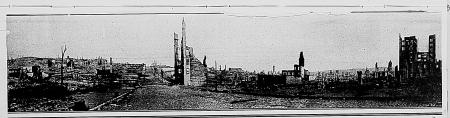


ALL THAT REMAINS OF SAN FRANCISCO'S CITY HALL. The rules as they are to-day. Larkin St. on left, Market St. on right.



PANORAMIC PHOTOGRAPH TAKEN FROM NOB HILL LOOKING EAST.

On the extreme left is Russian Hill. Next to it is Telegraph Hill, behind which lies North Beech. The large building on the right is the Parmount Hotel. Across the street is the Hopkins Art Institution.



LOOKING EAST FROM THE CORNER OF BUSH STREET AND VAN NESS AVENUE.
In the centre stand the remains of the Flood Building; on the right the City Hall.



THE JEWISH SYNAGOGUE.



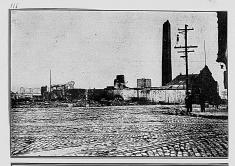
ST. JOHN'S P. E. CHURCH.



LOOKING NORTH ON MONTGOMERY STREET.
The Crocker-Woolworth and Union Trust Buildings.



THE GRANT BUILDING AND POST OFFICE.
Seventh Street, Between Market and Mission.



MARKET ST. RY. POWER HOUSE. Corner of Valencia and Market Streets.



IN FRONT OF THE CALL BUILDING.
Stockton and O'Farrell Streets, Looking East.

## HOW THOMAS A. EDISON TAKES A VACATION-

123



ON HIS WAY THROUGH VIRGINIA



TMOMAS ALVA EDISON 2.706
Latest picture, taken at themset the famous threator and schemital. (Photo by Founder Organ)



PRESIDENT ROOSEVELT Delivering his speech.



The NRY H. ROGERS,
Today one of the most improvive facines in the world of cristia and industry: Nr. Rogers is believed to be the direction in efficiency in Standard 100 operations, and this influence is disminant throughout a wide financial domain.

(Fish, Cryptile, Ns. & Judiersed & Enderweyd, Nr. 1)



Fifth Avenue and Fifty-fourth Street in 1877.

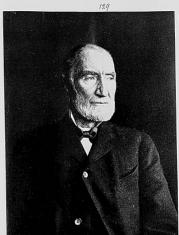
JOHN P HOLLAND, Od 1906, Inventor of the submarine beat, Od 1906, in his office.



PRESIDENT ROOSEVELT.
rom photograph taken after dining with the crew on board the battleship Missouri during his visit to the North Athantic Rect.



A photograph taken at the top of the Eiffel Tower, showing the new military Jauch balloon La Patrie sailing over Paris, The Arc de Triomphe can be seen 1907



JULY 1986 JOSEPH G. CANNON



ANDREW CARNEGIE IN HIS STUDY, AT HIS HOME IN FIFTH AVENUE, NEW YORK

AND A COMMENT OF THE STUDY AT HIS HOME IN FIFTH AVENUE, NEW YORK

AND A COMMENT OF THE STUDY OF THE STUDY







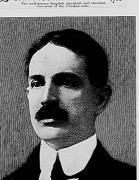
131

Oct SIR NORMAN LOCKYER, 1906
The eminent English netronomer, whose many writings on
this science are regarded as authoritative.

194



Oct SIR WILLIAM CROOKES 1906



PROF. T. W. RICHARDS Qut 1906 Of Harvard University, who is to become at the University

Amos Whitney, one of the founders of the Print & Whitney Composity, Hartford, Comp., and Mrs. Whitney Composity, Hartford, Comp., and Mrs. Whitney celebrated their golden wedding at Hartford, September 8, a great elvelo of friends shouling in the foothvilles, 8, a great elvelo of friends shouling in the foothvilles, 1000 people attended the reception given by Mrs. and Mrs. Whitney at their residence, where they were asset Mrs. Whitney at their residence, where they were asset means the state of the state of

Though approaching last seventy-fourth birthinky. Almow Whitings will fill fill an active and important part in the industrial life of Hartfords, after more than haff a century of lows panniafeturing experience. The corporation that bears his name is known the world over as one of the greates of its kind. It is more has always been one of the greates of its kind. It is more has always been upon the properties of the control of the control of the control of the known that the control of the contro

identified with machinery and machinists' tools as denoting a standard of excellence. The two great New England names of Pratt & Whitney and Brown & Sharpe have for years been linked together everywhere that metal is fashloned, and Mr. Whit ney has the enviable and ing not only a founder of one of these great estab-lishments, but also one of the men who have carried it through from a small beginning to its great proportions of the present day. He is still a director of the cornoration though taking a less active part in its management than be did up to a few years ago. His cureer is one of unu

He was born in Biddeford, Maine, October 8, 1832, of old New England stock. Ills father, Aaron Whitney, was an expert locksmith and machinist. Amos Whitney received

his entry cliention in the village selonds, and at 14 years of aga was apprenticed to hearn the machinel troe were all the process of the process of the control of the process of the pro

does to maximate that of piece of strong effort on the part of the Colt management to persuande him to remain there. The firm of Pratt & Waltney had its beginning in 1800, in a little device known as a spooler, used in textile manufacturing. Messrs. Pratt & Whitney saw in its

number the operating to make some some; and they femend a permission and shadow for the present and they come to be a surprise of the present that they are the Pursai Works. In the beginning two may were a surprise of the present the

incorporated, with a capital stock of \$350,000. Capital and the business have grown together. Mr. Whitney was vice-president of the company and superinin 1808 was made its president. Under the alliance with the Niles-Bement Pond Company he is a director of the Pratt & Whitney Company, He has other manufacturing and general business asso treasurer of the Whitney Mfg. Company, of which his only son, Clarence E. as director of the Pratt & Cady Company and of the Hartford Falence Company nd as president of the Gray Telephone Pay Station Company.

134

Company was organized and



AMOS WHITNEY,



JOHN T. MICHTCHEON
Connecte and new corresponder
WHENTER ON 1907

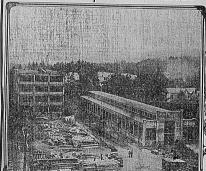


SARAH BERNHARDY

FILM OF CAST OF CAST OF THE STATE OF THE

# Idison about to give blow World His Jreatest Wonder

The New Storage Battery, which is to Revolutionize Industry and transportion, will soon be put on the market.



Building under construction for the monufacture of Edison's Storage

for public use.

"A practical theory," says Edlsen, "Is a good lead, but it is not a sure thing."

The problem "he waves sure that you had solved this problem." he may see that you had solved this problem." A sure that you had solved the problem. "A sure that you it was sure." replied the problem that you it was sure." replied the problem had been a sure that you had not been a sure that yo 22 23 23 There is a gayety about The Wizard these days that is unmistakably indicative of a new discovery, for when he is in a "blind mood," when Nature results to reveal her secret, he is as tragte and silent as the cable.

miles an hour, on one charge, for 150 miles. At that time vehicles of the Adams Express Company were using the storage batteries, and they have been

using the storage batteries, and they have been doing so ever since. Any other inventor than Edi-son would have been quite satisfied with this solu-tion, and would have put these batteries on the market, but his commercial genius is no less re-markable than his petentific intuition, for he has

refused many applications to make these batteries

t inventor has moments of exceeding and he rarely has time to make contraand he ravely has time to make contra-tal that when it is a amounced last year that a visible could be driven from New York to Philacotte without recharged the try-three miles as hour without recharged the try-three miles as hour without recharged the the public teries, he did not deary it till long rates the public land was satisfied that it was trae. Then he quiet-ly tool seems one that a light vehicle might, under the miles as hour, one case, he made to run at twenty miles as hour, one case, he made to run at twenty miles as hour, one case, he made to run at twenty

as the Sphinx,

He says that he will be able to sell at the cost of
\$10 a cell a storage battery that is almost inde-structible. It will travel a hundred thousand miles structible. It will travel a hundred thousand miles before it is worn out. Twenty colls will be all that is needed for a runabout or broughain, and exty cells will be enough for the largest and heaviest truck used. For \$200 one will be equipped with motive power that will need no renewal for fifteen

"Now, it lies with rubber tire manufacturers to meet this commercial reduction of motive power," and Mr. Edison, gayly.

faile art. Edition, gayly.

"Can they do it?"

"They have been getting ready for it quite a while. A lot of them are working at it quietly. That will come, of course.

For three years \$5,000 storage batteries here been constantly at useful in the start shows the Thick

constantly at work in the test shops of the Edison plant at Orange, N. J.

"I never believed that Nature, so prolific of ro-

durability.

"You see, it inkes about cloven months in exportmenting with a battery to be prepared for surprises in the phenomena of Nature," he continued;

HOMAS A. EDISON has accomplished a surprise for the world. He has worked out successfully the problem of cheap power. He promises to put on the market within six

Its promises to put on the secretary proven a great product of the product of the

"sometimes longer. So it has necessarily been slow work. A very promising battery would work all right that long, and then something would go wrong. The public doesn't understand these things, and they get impatient, as if it was only a matter of ex-

scientific mind, conceive, failed.

"Then I tried cobalt," he said, and punctuated the statement with a broad smile.

the statement with a broad smile.

"And it worked?"

"It certainly did; but, cobait being one of the rare metals, the problem was not solved. I secured the country to find cobait in sufficient quantities to warrant its use, and discovered lots of it in Can-

periment, and I could hurry it."

Well, nickel-rust failed, other things failed, everything the ingenious Edison could, with his trained

ada, in Wisconsin, in Oregon, iin Kentucky. Then I cheaply, within a ratio of cost already calculated for the price of each cell." 27 22 21

eneapy, within a ratio of cost already calculated for the price of each cell."

"And you have succeeded?"

"Completely. I can positively promise that the new battery will be on the market in the Spring. The factory buildings are ready and the machinery is

"But there may be some surprise that Nature is holding back, that will interfere." "Absolutely none. I haven't kept 25,000 batteries The eminent German author and playwright.

weeking for large over without discounting all changes of families. The state of th of the unforeseen. When the electric light was first introduced, the

"When the electric light was first introduced, the wires were inclosed in iron pipes laid underground, and Mr. Edison in explanation of the devious and mysterious ways of Nature of the performance of unexpected deeds. "In every country in the world these iron pipes were efficient except in Italy, where some peculiar quality of the soil literathy are unexpected surprises of this sort have delayed

Unexpected surprises of this nort have delayed. Mission's storage hatter, and togot him working with single purpose at it for four years and a harf; but all that is a small matter in the face of the probable fact that in another year the horseless vehicle will be a small present motive power. In the present the power of the horse will be a currioutly we shall be produced to both at him card, and the present the product of the currioutly we shall be present the p

curioutly; we shall be paying 50 cents to look at him in side shows," may Bilson lo-day.

Much of the success of the new storage battery will depend upon the ability of the vubber tire manufacturer to reduce the cost and herease the durability of their product. Mr. Edison was pleasantly optimistic about this feature of the matter, but by no

means explicit.

If the manufacturers can only induce Mr. Edison to look into this phase of the coming evolution of the folial phase of the coming evolution of traffic the thing will be done, but the wizard is not interested at present. He intimated that there might be some emissionered materials a suitable as rubber of the property of the property of the property of the property of the superior solutions of the feet betterp—but that is another some solutions of the feet betterp—but that is another some solutions or the feet betterp.

In Edison's world of magic there is no such thing

In Delison's world of mangic there is no such thing as fail. When we consider the manner in which is had faced failure, again and again, in connection with the faced failure, again and again, in connection with gentless points a point as provinced from the promoting of the gentless points a first of the province of the delice. Once the thing is done, Dation basics himself as account one with that. Within the inclusive of the Delison works at Orange, N. J., two new factory buildings where the province of the delice of the delice

have just been added to meet the increase of trade in the phonogramly department, but there were not of any interest to him. His spirit and his eye, over on the future, were on the buildings where the strong-buttery was going to be made—in thousands. The actual cost of recharging the new battery The strain cost of recharging the new hattery achievement being in small per cell, the greatest achievement being in the per cell, the greatest achi

"I am a commercial inventor, strictly commercial." he raid.

cial," he raid.

The sometime offending but pepular phonograph
has shown that; in fact, nearly everything Ediaon has ever done shows it. Far more important,
to Edison's mind, was an operative storage
buttery that would be within the reach of every business man, especially the little man, than to
construct a demon motor that would kill and deconstruct a demon motor that would kill and destroy. Thirty miles an hour is fast enough for any ordinary purpose, and if speed is desired, there are the filers on the railroads.

the fifter on the railroads. The new storage battery is not designed to be of any use to the automobile. A friend of Mr. Zid-new rived a few coils on a trovola meshine while or the coils on the control of the coils of the coil

horse, means that the congestion of street traffic will be reduced one-half. It places within the reach of almost every one a private conveyance. Its effect upon the public afreet traction companies will be interesting. Allowing for the cloverness of the selling agents, once the storage battery is in course of manufacture, it will be cheaper to buy twenty cells and a runabout, that will last fifteen years, then to pay our fare. Their limited speed capacity (about thirty miles at most) will insure safety to pedestrians, and, as to the comfort and privacy that will accrue—there is no doubt us to which of the two ways of the traffic the public will prefer.

These are only spons of the achievements Edison, uno Made first in 185, promises and expects by just Spring.

SELECT OFFIAIR SOFFIANS

YORGON Feb From a thetegraph to Shadowill Clothe London 1988





Buildings exected for the menulacture of Edison's Storage bettery.

e news-republic de Alte is alone in the legation. White House Awalts Particulars. White House Awaits Particulars.
At the White House it was selected not to make any rouly to the message of Minister Bryan until further particular and the crime had been received. The impression spread in the diplomatic circles that it was due to the peasorship in Lieuwin and the more information had been the contract of the contrac

of the structure per by Newstonia attack on Portugal.

Bon Miguel do Bragania, the presinder from Portugal.

Bon Miguel do Bragania, the presinder from the per section of the death of King Carles and the Crown Phines. The father Carles and the Crown Phines. The father Carles and the Crown Phines The father Carles and the Crown Phines The father than the Carles and the Crown Phines Carles and the Crown Line and Carles and the Carles and t

CONSUL DOUBTED REPORTS. Viscount da Costa, Who Knew the

King as a Boy, Praises Him. King as a Boy, Praises Him.

DOSTON, Marsh, Pob. 1.-Prominent.
Portuguero residents of Boaton were
natiounded when informed to-night of the
assussination of King Carlos and the
Crown Prince of Portuguice. The largest
colonies of Portuguice in the United
States are located in Kew Hinghand, and
they have been greatly interested in the
selected struction in the old country for

positical situation in the old country for Inlimited Inl ford, The Viscount was looth to believe th

The Viscount was leash to believe this of newer form Libeon, and was greatly to fine the firm Libeon and was greatly to the property of the control of the c

ome."
Vice Consul d'Almeida was astonished pe like Vice Consul d'Almeids was natenished a Duc when the announcement was made to a May him. He said that the latest information as the he had from Labous was to the defect that and he the Premier was afruid of a revolution.

18. If it is the thought that moch would depend upon the position taken by the army, which at find the Premier, and the Premier.

PERSONALITY OF FRANCO. k by 8 Dictator of Portugal Who Fought for

The recent treashes in Portugal have brought to the front a new figure in for for Bropean affairs, Jeao France, whose assumption of the dictatorrhop of the king-to her dom made him a man to be figured with and the



THE WEATHER.

Fair, cold wave, high west winds today; continued cold to-morrow.

'S BRAVERY IS VAIN

Herself in Front of the

n Prince-Two Assasa Killed by Guards.

FEARS A REVOLT

in Barricaded in Their 29 - Premier Franco edrriedly Consulted.

ANGERED NATION was without

Carlos's Last Acts Was Inction the Severest disembarked for the pur

ment that the own intermetter hand been supported by the control of the control o

tures Against Plotters. across the Tagus in reaching the actual rine Areanal nearby. The King and g, Feb. 1.—King Carlos of and the King and Queen and the two of the spectators, hastly did everyand the Crown Prince, Luiz Princes entered the leading carriage, thing possible. His efforts were withswore assassinated to-day and which started immediately, wheeling out avail for the King was dead and the

they were cumningly arranged. The who had escaped the bullets from the

is in a state of uproar. The into the Prace Do Commercio. Prince expired within a few moments.

CARLOS AND CROWN PRINCE LUIZ PHILIPPE WHO WERE ASSASINATED



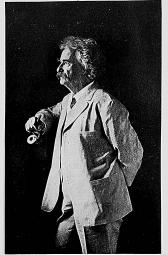








Financial Reform.



Outlook New 1907 MARK TWAIN



Hum Madusu Iguare Finn He Metuspeldan Inoco Atril 1908







White In military uniform with a 'declighted' smile." Higgy Secretary Lock, the President, and Major Patcher at Yellanotters Park.



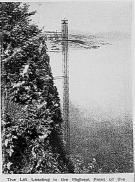


appleton Sep 1907

154



OUROR WAS 707.



158

Burgenstock, Overlooking Lake Lucerne.



ELIHU ROOT,



Samograph copyright, 1997, by Underwood & Underwood, N.
EDWARD H. HARRIMAN, RAILROAD EMPEROR, IN HIS PRIVATE OFFICE, 120 BROADWAY, N. V. The Harinard so solide offer, when before the Intensite Connecte Countries on a tide the president on milroid matters has a fine-related. But the magnitude of such matters seriously suggests that there also has been predented with the president of the connected of the president of the countries of the Denarmont of Tamaspeatation. The recoils mouth to the finds secretive rance importal and solid indused, it is be a stated for the Denarmont of Tamaspeatation. The recoils mouth to the finds secretive rance importal and solid indused.



MAHOadso abil 1908

164

165



# 16% WIRELESS ODDITIES

BUT FAVOR DAY MESSAGES TWIST Meh 29 Dommercial Range of Wireless Has Increased from 200 to 2,500 Miles in Seven Years.

from Conwell were desary received at the parameter of these, in many cases the parameter of the parameter of the sense of

TOLD BY MARCONI

The precision and the state of the state breign Correspondent Fannicker Vonachtens.

LONDON, March 20.-William March 19.-William March 19.-Will

lakars no premiumi a part. Los adds

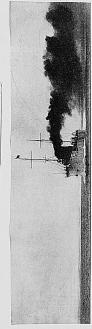
"I self for Newformstand as New Tell

"I self for Newformstand as New Tell

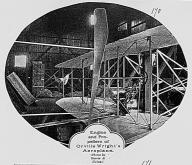
"I self for Newformstand as New Tell

"I self for Newformstand as Newformstand as New Tell

"I self for Newformstand as Newfo









Parts 64 Olivedinst



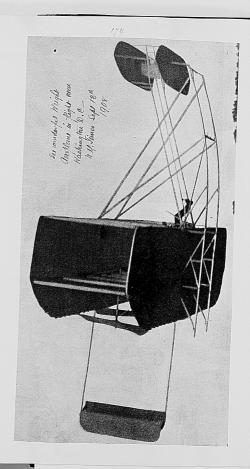
Jaking 's



Photo by Clinedinar





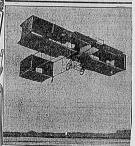


ograph of the Conqueror was taken as th

was bursting-the saggy lower part of the envelope is plainly visible.

Photographs of A. Holland Forbes, above, and Angustus Post, who tell a thrilling story of their 4,000 foot fall from a balloon. Andrew Carnegie and Miss Mary Garden.



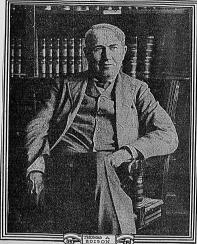


Wright brothers for a series of exhibi-Wrigant prothers for a series of axhibi-tions with their aeroplane in Berlin during the coming Summer. The flights will take place over the famous Tem-pelhot pande ground on the outskirts of the capital, where the trials of the French Volstin biplane by Armond Zip-fel were recently held under the Lokal-neybears, anglest anxelger's auspices.

Owing primarily to the discouraging

Owing primarily to the diacouraging weather the trials were only partially successful, but they attracted an enromous concourse of spectators day fater day, indicating that the Kaiser's propie are keenly interested in the flying ma-







form of human energy will come to us with our eggs and bacon every morning, but we can be sure of having morning, but we can be sure of naving it as a regular item in the daily pro-sramme of events. There is a general, quite vivid, impression of this fact, as Mr. Thomas A. Edison sees, or rather senses, the future.

ees, or rather ennes, the future.

116 has enversed from the commercial aspect of
the made that the hidden in the obtainables of natice of the commercial that the second in the continuous of the
prospect for improvement, the liver have the being
prospect for improvement, the now but a children
to being manufactured to the utilizate solution of comowny in terfair, the phonograph is now but a children
the hand, as a confurer smillagly hown himself off
the band, as a confurer smillagly hown himself off
the setting, in ambito acknowledgment of his trade.

"We only have five mess, that is the trouble"the setting the property of the bendy and the bendy"
has a present the setting th

who Uncertainty in Invention. She Uncertainty in invention.

To the average mind there is the imprisonment of a circuitous perception. We identify with our senses, everything—but mystery, A desperate uncertainty will perplexes the inspired makers of invention. A ensitive co-relation between all phases of scientific discovery the straint feditors of modern ex-periments. The straint feditors of modern ex-positions of the straint feditors of the straint Joint to the foresight of Editors present activity. He is not "dreaming" in his laboratory; there is not because the straint fed to the straint fed to the he says, after threasenry parts of capter industry to eath the scoret withsperings of natural phenomena, a busier mist than he ever was before.

"Everything, Anything, Is Possible." "We know nothing: we have to creep by the light of experiments, never knowing the day or the hour that we shall find what we are after," he says. Mr. Edison looks, as he always did, young for his years, for his time.

He seems to have reached an Autumn that does not change outwardly; an Autumn that vells the conscious energy of his life.

"Now that I've retired from the commercial as-pect of my work in the laboratory, I suppose I shall really work harder than I ever did in my life," he

Twe always got more than one thing in course of development, twenty things that I hope to do, or that I hope some one clso will do. Scientific dis-

## "Everything. Storehouse of Supplante

coveries are coming so thick an many of us working like beaver appalling merely to think about future "

future"
"Beerything, anything, is p
a vast storchouse of undiscovers
"There is a great distinction
the scientific experiment that a
and the practical adaptation of
large. We road of wonderful th
perimentally, but whether they;
practically is another matter."

"Shall we ever fly through the "Oh, yes, undoubtedly we a come. It won't be the aeropla won't be the dirigible balloon. may suffice to make a very i experiment, but it is not what c lieves, that is the solution of a come out of a universal law i

not, upon the skill of one man but of a machine for all men.

"The scroplane is a remark it comes as a theory, controlled that theory, and is not yet adjust But I firmly believe that seems low to fiy, it's only a matter of the seems of the galaxy on in the form accessed galaxy on in the form accessed. promises new wonder, new sen

"What is the immediate :

"What is the immediate a future?"
"Power that will be gener "Power that will be gener It's not new. A bot of them and been working at it for some time tricity in any requirement of a have to hurn cont, make steam The next step is to generate che cont itself. Cont is a carbon, the sam's heat, and carbon is two know of. I haven't does twill. The power is there unquestill the control of the contr but not to an extent sufficient discovery. The first indications that appear in experiment are Man is slow to understand, his enough to gather all the mean science,"

#### Electrical Energy in Coal.

"There is a direct electrical have to overcome in obtaining have to overcome in obtaining hand from coal is the ashes—ij, get it from zine, iron; why no far, however, we have only accor tifle experiment. I haven't done how; I hope some one will." Edison has joined the elect | ment, he seeks an impersonal st universal knowledge.

"Do you think the railreads pense with steam entirely in favo "Well, what we need most to that means of transportation is railroad men. Most of them as to see and hear the progress of The wizard smiled dryly an

rb got a be railreads are old-fashio tot has Gurinen who run them are may be an exception, more than the one I can think of just now i tion of the Great Northern Rails water power now. But, of cour like Hill. It was just the san



w Carnegie and Mary Garden. t the Liner Adriatic, on its Recent prival at New York Lay 8 1908 Photo by Brown Bros., N. Y.)

ying at Tempelhof.



for a series of exhibi ir acroplane in Berlin ig Summer. The flights over the famous Tem-round on the outskirts where the trials of the splane by Armond Zip. held under the Lokal-

tea.

It to the discouraging this were only partially hey attracted an enoroif spectators day after that the Kaiser's people inted in the flying ma-

EDISON form of human energy will come to us with our eggs and bacon every

morning, but we can be sure of having

it as a regular item in the daily pro-gramme or events. There is a general, quite vivid, impression of this fact, as Mr. Thomas A. Edison

sees, or rather senses, the future.

He has emerged from the commercial aspect of

the magic that lies hidden in the obstinucies of na-

ture. Canned opera and moving pictures have their prospect for improvement, the storage battery is

being manufactured to the ultimate solution of econ-omy in traffic, the phonograph is now but a child's wonder, and Edison dismisses them with a wave of

the hand, as a conjurer smilingly bows himself off the stage, in amiable acknowledgment of his trade. "We only have five senses, that is the trouble;

we have to creep through the world at the best,"

estill perplexes the inspired makers of invention. A

To the average mind there is the imprisonment of a circultous perception. We identify with our senses

The Uncertainty in Invention.

he says.

sensitive co-relation between all phases of scientific discovery in the striking feature of modern ex-periments. These are thoughts that, as an index, point to the forceight of Edison's present activity. He is not "dreaming" in his laboratory; there is no self-indulgent retirement. He finds himself, so he says, after threescore years of eager industry to

catch the secret whisperings of natural pheno a busier man than he ever was before. "Everything, Anything, Is Possible."

"We know nothing; we have to creep by the light of experiments, never knowing the day or the hour that we shall find what we are after," he says. Mr. Edison looks, as he always did, young for his years, for his time

He seems to have reached an Autumn that does not change outwardly; an Autumn that vells the ceaseless energy of his life.

## "Everything, Anything, Is Possible," He Declares; "The World Is a Vast Storehouse of Undiscovered Energy" --- A Future in Which Steam Will Be Supplanted by Electricity---New Motive Power May Be Discovered.

coveries are coming so thick and fast, there are so many of us working like beaver, at them, that it is appalling merely to think about possibilities in the future"

future"
"Everything, anything, is possible); the world to
a vast storehouse of undiscovered energy.
There is a great distinction, however, between
the practical adaptation of properties of the practical adaptation of properties of the practical adaptation of properties of the practical properties of the prope "Shall we ever fly through the air?"

"Bull we over for through the start"

"On, yes, modestedly we shall it's bound to
"On, yes, modestedly we shall it's bound to
work the start of the start of the start of the start
work that the start of the start of the start
work that it is the start of the start of the start
work that it is the statute of the start of the start
leaves, that is the statute of the start of the start
leaves, that is the statute of the start of the start
white of the start of the start of the start of the start
if it is a manifold to start of the start of the start
if it is a manifold to the start of the start of the start
if it is a manifold to the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start
if it is a start of the start of the start of the start of the start
if it is a start of the start of the start of the start of the start
if it is a start of the start of th

"What is the immediate motive power of the

returns?"

- Power that will be generated without steam. It's not new. A lot of them and working at it; have stream of the steam of the that electricity can be generally direct from coal because it has been done as a signific experiment, but not to an extent sufficient to call it a practical discovery. The first indications of a scere it in atture that appear in experiment are glavays very feeble. Man is slow to understand, his five senses are not enough to gather all the meaning of experimental Electrical Energy in Coal.

m'schleyously.

"There is a direct clotteries of the difficulties we will be a direct clotteries of the difficulties we will be a direct clotteries of the difficulties we will be a direct clotteries of the difficulties will be a direct clotteries of the direct c

Edison has joined the elect in scientific experiment, he seeks an impersonal structureral knowledge.

"Do you think the railroads will eventually dis-pense with steam entirely in faver of electricity?" pense with ateam entirely in favyr of electricity?"
"Well, what we need most to perfect, to improve,
that means of transportation is a new generation of
railroad men. Most of them ale getting old, slow
to see and heart the progress of yearts.

The wizard smiled dryly and his eyes twinkled

consists energy of his life.

"Now that I've writed from the commercial as "Power that I've writed from the commercial as "Power that I've writed from the commercial as "Power that I've writed from I've writed

it was installed and they found out how well it worked! There is always a technical investigation of a new idea in science that is reliable and can

No, Mr. Edison wouldn't be quoted, but there was one Eastern railroad that adopted an impossible system of electrification, and another one that was using the correct and only system of electrical rall-roading. The one that was having trouble should have regarded the technical opinions against it. The other one was running smoothly, easily. But these were merely questions for the men who run the rull-reads. The inventors had worked it all out for them

"A new generation of railroad men will adopt "Why not? We haven't half demonstrated the "Why not? We haven't hait demonstrated the forces of water power yet as a universal energy in engineering. The Pacific Railroad is using it somewhat, to be sure-but-well-" That was all up to that new generation.

"Can the tides be utilized to run dynamos to any

important purpose?" "No, the energy of the tides is not great enough to generate sufficient motive power. I don't believe that will work out." "Will the sun's rays be harnessed to do the work of machine powers?"

Harnessing the Rays of the Sun.

"As a scientific experiment that's aircady been done. In fact, in a small way, there is a practical demonstration of it I believe in the West. In Arizona I saw a thirty horse power motor run by the rays of the sun by reflecting the sun's rays in mirrors

and feening this light upon a copper boller.

"Oh! but we don't know! Quite probably there is a motive power in the light of the sun as it reaches the earth that may be utilized some day. The indications of scientific discovery are so amazing and the co-relation of all its various forms of progress are so intimate that we just begin to find out how feeble we really are to cope with them. Look at hacteriology, what wonderful advancement there is in it."

This was a new interest that the Edison factories had not considered, but it was an indication, a chance suggestion of the increasing scope of Mr. Edison's sweep of scientific activity.

sweep of scientific activity.

One of the gentlemen who presides over the commercial destinies of the Edison factory in West Orange, N. J., described Mr. Edison as an "optimist who was inclined to elaborate the scope of his inventions." So much is due to this "optimism," however, that it would seem to be a special respon-sibility of the times to encourage it.

"I've been five years and a half trying to get my

storage battery perfected; that was a long pull; it came hard, but it has come. They're making them out there as fast as they can," said Edison, waving a hand in the direction of the storage-battery build-ing. There was no optimism about this. The stor-age battery had lost its interest since it had become

"The result of it all will be an electrical taxicab. I've been interested in that—in fact, I've helped to design a taxicab that will run smoothly and easily by "Will the electrical taxicab be cheaper than the

same vehicle in New York now?"
"Oh, well, that's a matter for the administra-

"We've driven an electrical taxicab over 5,000 menters.

"We've driven an electrical taxicab over 5,000 "Put it miles at a speed of fifteen miles an hour over the and it was

electrical power was proposed for the elevated reads in New York. Remember how JAG doubt and Bluester Sage delayed and bleeked the installation of elec-tricity? And then, think how gad they were only the second of the storage butteries were concerned, but the test now is to get a vehicle that will conform to the efficiency of the batteries I am told that by January next an electrical taxicab will be seen in New York."

At the offices of the Edison Company it was said that it would be quite feasible, were it necessary, to make a reduction in fares with the electrical taxi cab over the taxicabs now in use.
"The storage battery is literally ready?"

"Yes, that's done. You see, after testing them for a certain length of time they began to run down. Then I recalled them and began to study on the problem again. It was found, however, that those in use did not run down any further, as we expected, but retained a fixed degree of energy, somewhat less than we had at first estimated," said Mr. Edison "The effect of these batteries upon street traffic has already been widely explained."

No Artificial Black Diamonds as Yet.

"Nothing new in the phonograph?" "Improvement, considerable improvement, I think, Instead of the two-minute record we used to have we now have a four-minute record, which means that we can reproduce musical compositions with more delicacy and accuracy than could be done be

This has been acquired by doubling the number of threads on a record from 100 to 200. This re-quired new machinery, a new material out of which to make the record and an entirely different style from the old one in use before.

It had been announced that Edison was perfecting the discovery of a way to make black diamonds, treasures that are very scarce and expensive, but are used chiefly for drilling in the mining of preciou

" I have not discovered a way to make, artificially, the black diamond, but I am working on it, among other things that interest me. The discovery, if made, is not one that the general public can full appreciate, but its importance to the mining world is very great. At present the black diamond is used for drilling, but it is very rare and very expensive. The advantage of an artificial black diamond would render millions of dollars' worth of precious metals lying undiscovered in the earth to-day accessible to the miner. I hope some one will discover it if I don't. It ought to be done as a vast industrial necessity of modern progress in scientific experiment."

"Experiments indicate that the black diamond can

be made artificially?" theory is a good lead, it is not a sure thing; but there is probably 85 per cent. of the earth's hidden treas-ure untouched because of the lack of facilities to drill them out of the rock to the surface. That is incentive enough to the inventor, if he needs any."

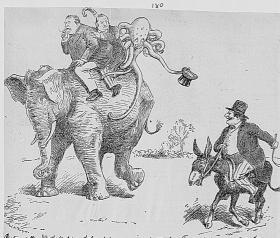
Under the earth, and over the earth, since Edison has shaken off the commercial shackles of his genius, are the broader fields of his sensitive industry to

The air itself is being compressed into utility, he

the nitrogen of the air and use it for fertilizing purposes of the earth," he said, and, jumping out of his chair, he stretched his arms wide apart in heer distraction of the scientific possibilities of "ture. "But we are told the earth will som

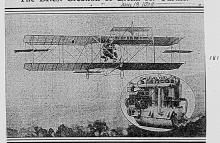
"Oh in a few billion wasne that tion," said Edison. The commercial details were a billion years what can't we accomm. Mr. Edison is conservative; ) "We have been giving the thing a final and sometional vagaries of fancifr

"Put it all down as it is,

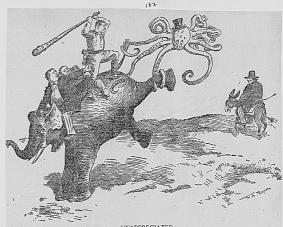


Cutom after 10 Relatelle declared he was going to the for Tast N.Y. Holes Out 3 May THE ELEPHANT IS TICKLED, BUT NOT TICKLED TO DEATH.

# The Latest Creation of Glenn H. Curtiss.



Aeronautical Society's New Aeroplane Equipped with a 4-Cylinder 25-Horse Power Water-Cooled Motor.



### UNAPPRECIATED.

FOR SAILING THE SEAS.

in Fuel, Type of Vessel, and Power
Many Things Are Needed.

By LEWIS NIXON.

NVENTIONS in connection with seagoing vessels come just as unexpectedly as on land.

tion in types of vessel or methods of propulsion, as great vessels cost too much to permit other than the most conservative experiments. The production of steam has, so far as excounty in fuel consemption is con-tractional to the steam of the steam of the But the steam of the steam of the steam But the steam of the steam of the steam But the steam of the steam of the steam But the steam of the steam of the steam But the steam of the steam of the steam But the steam of the steam of the steam But the steam of the steam of the steam But the steam of the steam

will increase may lead to a more actions are use of the sailing ship, as winds will continue to blow and their energy cannot be cornered. But the sailing ship of the fature will, I fed; sure, be an auxiliary—that is, have power to drive her in calma and sazinat head wills. The engine for this purpose will. The sail currently be the gas esgino. The next energial the sail continues the sail currently be to follow the great success of the gas engine, on the pulse of the gas engine, on the pulse of the gas engine, and the pulse of the gas engine sail to the gas engine pulse of the gas engine sail to the gas engine sa

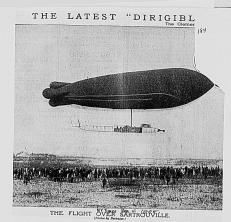


LEWIS NIXON vantages to be gained from the use of strongest sections of less weight will result in a uniform advance, but this is always going on.

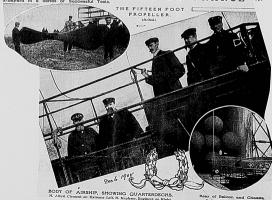
Before many years we shall see the
absolutely fireproof steamer for carry-

absolutely fireproof steamer for carry-ing passengers.

But it will be with the war vessel that progress will be most speciacular. Heavier guns, heavier shell, more offi-cient powder, greater per sensitis of present development. I expect soon to see the heavy mast, conning towers, and smokestacke disappear. They are all needless, and the future battlenthy will not have them.



E" TO GIVE DELIGHT TO FRANCE 185



## MESSINA'S BALANCE SHEET

CALM ESTIMATE: 120,000 LIVES LOST: \$20,000,000 DAMAGE.

Messina No Phoenix, and Owners May Have Difficulty in Rebuilding— Moving the Residence District Back to Relative Safety—The Hills Stripped of the Rich Soil of Centuries.

Rectal Correspondence of The Evening Post. 1 Carns, January 16.-On my last day in Messina the tightly packed archives were exploding in the ruins of the Municipio, and the charred papers were whirling down the north wind. I could not restrain the re-Section-Here so the surrivers. Without these papers mone can prove that he was born, much less that he has survived; none can marry, inherit, or transfer property; erform any civil act, in short. Such are the beauties of a code that assumes every man to be an outlaw unless he can prove the contrary. What civil standing the undocumented refugees might have received by special grace I can only guess. It is fair to say that the Italian universities have consented to accept the furtility students of Messins own though unprovided with blath certificates But I confess I felt bannion when I read yesterday that in some office of the profect copies of the archives had been saved, so that-I translate literally-"Every Messinian will be enabled to reintegrate his civil state."

gate as serif sachman extended and the series of the series of the series ser

BOUTERS DURSTIFEED.

Both privates some blick statusts and use to the private some both statusts and use private themselves or can be subset of give to come in the desiral when have it as the considerable of the considerable o

position to make a pretty close estimate.
His estimate agrees closely with that hazsrded in my carlier letters.

Outside the Aerodrome,

In the common of Mentin, he houses, high own between periods, or considerably prove than half the population, which was recordly 199,000. By reclusion, we want to be supported to the control of the con

the shock. The Arthur personnel of the Control of t

MONIT LORS, R.D. 600, 800.

The Martins or Naples, which is uncommonly well informed in this case, writers "We may recken as destroyed the houses with the second of the s

the value of the destroyed houses as the ter real at 150,0000, Incidenting the illidhouse so taxed, and the cost of rebellides the public strategies, the construction bull of the public strategies, the construction of the Evidenty this is a value press, Public hubbing in southernous agreement in Intervaling it is combined in Figure aboves with the construction of the construction of the Evidence of the Construction of the European are based on a common of child the European are based on a common of child the European are based on a common of child what manifers or the European of the Construction of the value and the Construction of the Construction of the Construction of the Walt smallers.

what smaller. Evidence who may confidence the Delanity in proprietor who may confidence the property (or may be esterned) to consider repatring it may be esterned by consider repatring it may be esterned to the property of the property of

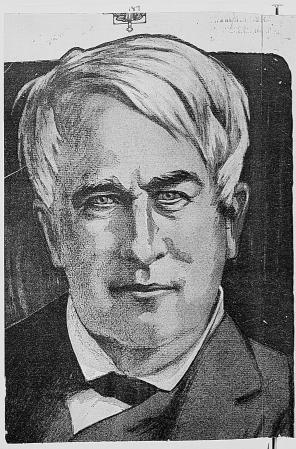
2,000 Kramships with an expert and my pret tomage of too,000 Commorcially new as filling behind Canani, and Paleran, was filling behind Canani, and Paleran, and the control of the control of the control of the control of the pret will contain only the necessary and that the pret will contain only the necessary and that the renderalite dry will be without the past of relative natery in the rest of the control of the control

DAMAGE IN THE FIELDS, TO

Let us add that if the minst rests chiefly on the world specified of the desire rejective to the unmarked damage in the fields has also been extraordinary. These terraced orchards and garden piots shock down their high facings of underseed stone puts befere a series of toreuntial rains. Much of the precious learn that has been creed by the labor of centuries has been swept down that the contraction of these provinces on their feet again will require months and perhaps years of well-directed side.

In calling this letter a balance sheet, I was too hopeful. It is meetly the first scribblings for such a result. Yet it may suggest something of the extent of the least, and may set forth some conditions of a uniquely difficult problem in government and private assistance.

The responsibility is heavy span these who are definitionary encountered from the control of the



# THOUGHTS OF THE GREAT WHAT ARE GREATNESS OF GREAT

"The great man is he who does not lose his child's heart."-MENCIUS.

"Great men are not always wise,"-OLD TESTAMENT (JOB).

"No man can produce great things who is not thoroughly sincere in dealing with himself." -LOWELL.

"He is truly great that is little in himself and that maketh no account of any height of honors."-THOMAS a KEMPIS.1

"Greatness of mind is not shown by admitting small things, but by making small things great under its influence. He who can take no interest in what is small will take false interest in what is great."-RUSKIN.

"Great men are the true men, the men it whom nature has succeeded. They are not extraordinary; they are in the true order. It is the other species of men who are not what they ought to be."-AMIEL.

"He fought a thousand glorious wars, And more than half the world was his, And somewhere, now, in yonder stars Can tell, mayhap, what greatness is." -THACKERAY.

"That man is great, and he alone, Who serves a greatness not his own, For neither praise nor pelf; Content to know and be unknown, Whole in himself." -OWEN MEREDITH (Lord Lytton).

# ABOUT THE QUALITIES MEN?

"Genius is mainly an affair of energy."-MATTHEW ARNOLD.

"There is no great genius without a mixture of madness."—SENECA.

"Nothing is more simple than greatness; indeed, to be simple is to be great."—EMERSON.

"'Genius,' which means the transcendent caacity of taking trouble, first of all."-CAR-

"Great men are they who see that the spiritual is stronger than any material force, that 'houghts rule the world."—EMERSON.

"Great souls are always loyally submissive, everent to what is above them; only small, mean souls are otherwise."—CARLYLE.

"He alone is worthy of the appellation who either does great things, or teaches how they may be done, or describes them with a suitable majesty when they have been done; but those only are great things which tend to render life more happy, which increase the innocent enjoyments and comforts of existence, or which pave the way to a state of future bliss more permanent and more pure."-MILTON.

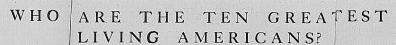
> "No great deed is done By falterers who ask for certainty." -GEORGE ELIOT.

"Rightly to be great Is not to stir without great argument, But greatly to find honor in a straw, When honor's at the stake." -SHAKESPEARE.



DIRECTIONS FOR HERALD WHY POLITICIANS ARE EX-READERS WHO WISH TO CLUDED FROM THIS EXPRESS OPPOSIONS. DISCUSSION.

the ten greatest inter the politician is a constant figure opprobrium. The Stancount man inter-



(EXCLUDING POLITICIANS)

"Great men are not always wise,"-OLD TESTAMENT (JOB).

"No man can produce great things who is not thoroughly sincere in dealing with himself." -LOWELL.

"He is truly great that is little in himself and that maketh no account of any height of honors,"-THOMAS a KEMPIS.II

"Greatness of mind is not shown by admitting small things, but by making small things great under its influence. He who can take no interest in what is small will take false interest in what is great."-RUSKIN.

"Great men are the true men, the men in whom nature has succeeded. They are not extraordinary; they are in the true order. It is the other species of men who are not what they ought to be."-AMIEL.

"He fought a thousand glorious wars, And more than half the world was his, And somewhere, now, in yonder stars Can tell, mayhap, what greatness is." -THACKERAY.

"That man is great, and he alone, Who serves a greatness not his own, For neither praise nor pelf; Content to know and be unknown, Whole in himself,"

"Rightly to be great

Is not to stir without great argument, But greatly to find honor in a straw, d Lytton). But greatly to make the stake."

1. The question is, When honor's at the stake." SHAK living Americans, excluding politicians?

2. In deciding this question the SUNDAY HERALD will be guided by the opinions of its readers. Pictures of the ten men receiving the largest number of votes will be published during successive weeks.

3. The SUNDAY HERALD asks you to send not only a list of men, but also your reasons for thinking these men great. 4. Give your reasons clearly in not more THIS

than a hundred words. The best opinions re- N. ceived will be published, with or without the writer's name, according to request.

5. Address all communications:-The Sur day Editor, New York Herald.

A CHARACTER STUDY IN COLOR BY LEO MIELZINER, THE SECOND IN THIS SERIES, WILL BE PUBLISHED IN THE SUNDAY HERALD OF NEXT WEEK.

"There is no great genius without a mixture of madness."-SENECA.

"Nothing is more simple than greatness; indeed, to be simple is to be great."-EMERSON.

"'Genius,' which means the transcendent capacity of taking trouble, first of all."-CAR-

"Great men are they who see that the spiritual is stronger than any material force, that thoughts rule the world."—EMERSON.

"Great souls are always loyally submissive, reverent to what is above them; only small, mean souls are otherwise."-CARLYLE.

"He alone is worthy of the appellation who either does great things, or teaches how they may be done, or describes them with a suitable majesty when they have been done; but those only are great things which tend to render life more happy, which increase the innocent enjoyments and comforts of existence, or which pave the way to a state of future bliss more permanent and more pure."-MILTON.

> "No great deed is done By falterers who ask for certainty." -GEORGE ELIOT.

ARE EX-

THOMAS A. EDISON.

Drawn by Leo Mielziner,

## WHAT ARE THE QUALITIES OF GREAT MEN?

"Genius is mainly an affair of energy."---MATTHEW ARNOLD.

"There is no great genius without a mixture of madness."-SENECA.

"Nothing is more simple than greatness; indeed, to be simple is to be great."—EMERSON.

"'Genius,' which means the transcendent capacity of taking trouble, first of all."-CAR-

"Great men are they who see that the spiritual is stronger than any material force, that thoughts rule the world."-EMERSON.

"Great souls are always loyally submissive, reverent to what is above them; only small, mean souls are otherwise."-CARLYLE.

"He alone is worthy of the appellation who either does great things, or teaches how they may be done, or describes them with a suitable majesty when they have been done; but those only are great things which tend to render life more happy, which increase the innocent enjoyments and comforts of existence, or which pave the way to a state of future bliss more permanent and more pure."-MILTON.

"No great deed is done By falterers who ask for certainty." -GEORGE ELIOT.

"Rightly to be great Is not to stir without great argument, But greatly to find honor in a straw, When honor's at the stake."

-SHAKESPEARE.





WHY POLITICIANS ARE EX-CLUDED FROM THIS DISCUSSION.

te the politician is a constant figure in the

limelight of public attenuou, ... draws to himself a large share of glory that frequently dies away when he retires from office. Thus, there may be differences of opinion as to the permanent greatness of Theodore Roosevelt, William H. Taft, William Jennings Bryan and others whom our readers would be likely to con-

sider among the ten greatest living Americans. We therefore ask our readers to include in this discussion only men who may be great in other lines than politics, such as invention, philanthropy, education, literature-in short, any of the arts or sciences.

This week we present a forceful character study by Leo Mielziner, the portrait painter, recently returned from Paris, of a man whom, we are sure, all our readers will select as one of the ten greatest living Americans, THOMAS ALVA EDISON. His inventions and discoveries have been of inestimable value to civilization, and his

fame has justly spread over all the world. Edison is unquestionably one of the ten greatest living Americans.

Who are the other nine a

## FLASHES TO STASGONSET DISASTER'S STORY AS HEARD BY WIRELESS MAN ASHORE.

Short Bulletins that Came to Him from Vessels Which Sped Toward the Rammed Republic After Satur-

day's "C. Q. D." Call-A Code in Which the Ship Is Known as "He."

Eve Dal -Ect Low - Durth 1000 Of the many versions of the crist ketween the Republic and the Florida, one story that remained to be told to-day was that of the operator at the Slauropeet wireless station, on the outermost tip of a sandspir sticking out into the waters from the Nan tucket beach. The narrative was taken from the official log of the operator. He turns in a log weekly to the head offices of the interters reserved to this atte

ing when the ery for boln fleshed out of the fog. Before that, during the hours that came after midnight, a few trivial joitings marked communication established with one ship or another, steaming aimlessly through the murk that covered all the coast. It is easy to imagine how the operator straight-ened up in his seat when his receiver began to bute faintly, ever so faintly, because is the stainber Borobile miles array out to see the water was creeping late the engi and flooding the dynamos and drewning out

"SC, SC (Sinscenset, Stanconset). This to MKC (White Star Republic). CQD." Stuttering, pausing, as if for breath, the message continued:

resage continued: "We have been run down and we are sinking rapidly. Send assistance rapidly. Our po-sition is 175 miles northeast of Ambros Light Vessel. Latitude 49.17, longitude 28. A WOMAN AT THE KEY.

or semestrately not heavy " said the Sint "I immediately got busy," sain the olas-canset operator, in his report, "and asked Woods Hole to inform the revenue cutter, lying in harbor, which she did." The operator at Woods Hole is a woman, a Miss Wright, and she proved herself level-headed in that time when quickness of decision was absolutely secondary. CQD, and, getting LL (La Lorraine), in-formed him of the distance. He said he was speeding to the scene. Then I got C (White Star Baltie), and he was doing the same. At this time I began to get very strong signals, from some unknown foreign ship, signed F. Gave him news. He is full-speed to the rescue.

ere was a break in communication after this, until \$:04 o'clock. Then: "Received captain's message from KC, and is sinking. Twenty-five south of Nan

bucket, and is in no danger." There is something peculiarly typical of the resident courties of the Benchlie's commander in that message. He was sinking, but he would not admit he was in danger. suges came thick and fast in the next

two hours.

8:20-"Cannot hear KC; probably out of usiness," wrote the Siasconset man. 8:42-"Hear KC calling to BC."

5:45—"Hear KC calling to BC,"
5:45—"Hear KC; tolk KC that BC and LL
are reading to sestatance."
A wong four titl Figure that
The pexty sensor was from the Preachman. At P.5 La Lorraine flashed through
the miles of fog:
"We are coming; our bollers are nearly

bursting." 9:15-"KC says his passengers are OK on

steamship Florida." 9:35. "Hear revenue cutters and may stations working." 9:42. "LL calling KC."

9:47. "LL gets KC and asks what death of water they are in and what kind of ground over, to direct his steering."

Evidently, at this stage of the game, the Frenchman was feeling nervous as to his bearings. He wanted to know what depth

he might expect under his keel.
"Thick fog with LL," the Sincounct oprater went on. "KC said to him, "Tell your captain to look for our rockets."

9:58. "BC calling KC."

10:12. "I started KC traffic to BC " This meant that communication between Sinscenset and the two White Star ships. the lamed and the rescuer, was fully or

10:25. "Cleared BC, Sent six: rorelyed The man at Slasconset meant by this that he had finished communication with

the Baltle; he had sent her six messages and had received none from her. 10:26. "BC and KC exchange MSGs

(captains' messages)."

10:45, "BC sending messages."

10:51, "Sent six and received ten." The Baltic had become leguacious by this time. The next few entries in the leg have

to do with the sending and receiving of messages. At 11:19 the Sinscenset operaton wrote: "Real MC Me to BC"

Translated into plain English, this means that he had transmitted the Benutite's messages and pleas for help to the Baltic, fast coming up to her aid. He added: "BC gives by now, 'PC and RCG talking."

"WY NOW"-KERP OFFET. "By new" is a slang term of the wireles tle was fleshing it so that she could have gulat to emphis her to make out the false was manipulating in the operating-room of the rammed ship. PC was the Portsmouth navy yard and RCG was the revenue cutter Greekam likewise steaming to the reserv

of the mishap.

For the next few minutes there was merely an interchange of messages be-tween Siasconset and the various ships that were steaming across the event circle of fog-hung sen, toward its centre, the Republic. At neon, the operator letted down. querulously:

"LA (Lucania) starts captain's message but BC stands us off." The Lurania had received word of the accident, and was rushing northward to-ward the converging circle of resentor ships. "Stands us off" may be construed as meaning that the wireless of the Baltic was interrupting conversation 12:10-"Cleared LA. BC repeats (relays) that KC will take only MSGs."

1:59-"Cleared Lt." 2:05-"RCG kicking up about not getting information spaner. This, it may be remarked, was a slur on the wireless operator at the Portsmouth yard, which doubtless caused the lonely man

In the but on the Mantucket coul done o chuckle as he wrote.

LONG MESSAGE PROM BALTIC. 3:66, "BC sends to LA- Republic expected to sink; has been in collision. Pas-, sengers are on heard Florida. Am search-ing for both ships. Position KC, latitude 40.17. Lingitude 70. Assistance required to take passengers off disabled Placids "

here for KC. Bit here, also, for LA, LL, and BC," It was about this time that the messages began to nour in for the shipwreeked pagsengers of the Republic. The operator was getting worried as to his ability to handle he mile: under the electrostenses

4:00. "BC asks all to stand by. LL traf-This last meant that the operator had not been able to get off his messages for La Lorraine.

4:45. "BC and KC trying to locate each other. KC hears BC's hombs to westward. oner. At nears BUE bome to westward.
Am standing by (keeping quiet) here, to
give BC a chaine to find KC. Gresham,
Mohawi, and Accepher, all Jamming."

"Jammings" is another word of wroless
septrobrium. The Jisacquant man. interred
by it that the revenue cutters were interforing with his signals. If there is anything that makes an operator "hopping mad." It is to have some one clse flashing out a current so powerfully that it intensure the direct transmission of his message.

#### MIN CHEESE BENDOVED

upon to excluder to read MC " continued the log. "Greeken calls me and asks it Republic has apparatus, and what is his eall. I told him: 'Stand off, You will only increase jam if you start calling him. BC Li, and LA are mest important boxts, and should have way made for them, if possi-ble."

All of which amounted to tolling the corky little revenue cutter that, while her corky little revenue cutter that, while her assistance was appreciated, she had better give room to her bigger sisters. give room to ner bigger sisters.

5:54. "BC gives by call and calls KC."

6:63. "BC says: "Think I can find you. Give me plenty of warning when I get near

6:14. "BC sends captain's message to LA -Florida in bad way. Needs conveying in. Don't know position. She is blowing four blests!"

\$:85. "BC sending to LA-Stand by Florids, fifteen miles due south of Nantucket! " 4:55, "BC sending to LA—Stand by Flor-

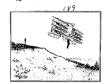
on."
7:21: "BC has found KC, at last." field "no sad tome no, at mea, So the long search was over. The renain-ing entries in the log tell of the final hap-penings on the day of peril and suffering

and bravery.

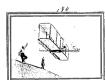
1:45, "Am clearing new. LA asks BC it he can preceed new and leave BC to escert

8:20. "BC sending captain's message to LA. Am trying to take it, nithough it is not easy on account of jamming of revenue cutters and shore stations using up air." Certainly one gets the impression that orrising one gets ing impression that the Sinconest operator has a deeply-scated "grouch" against the navy. 12 P. M. "BC to NK (New York)—'Am

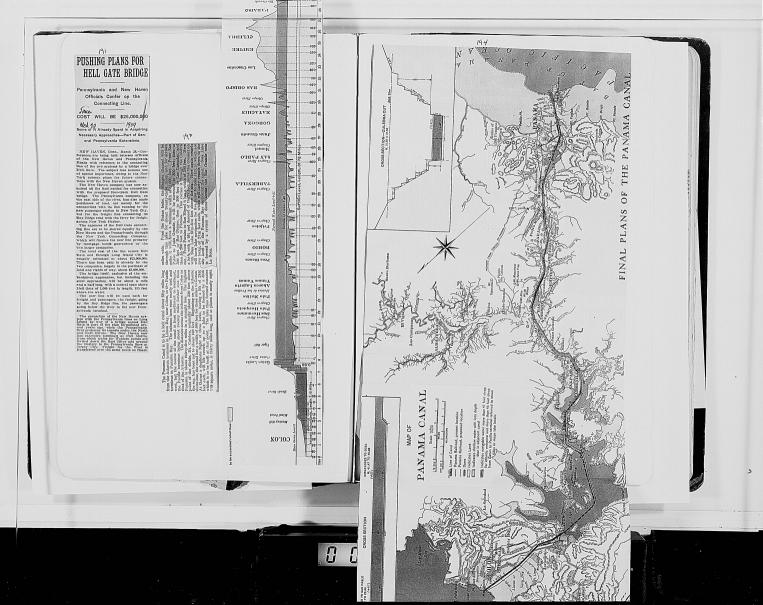
taking passengers aboard and escorting Piorida. Have left captain and boat's crew alongside Republic. He is still aftest. Wind is freshening."
That was the end of the Stancoust man's



CHANGE S NOTTIFLE WING MACRIME (1806)



MEANT TO THE WALGET GALDES (1902-1)



## FINDS RADIO-THOR AS GOOD AS RADIUM

New Substance, Declared to be Cheap and Efficacious in Many Diseases, Shown to Doctors.

MADE FROM PITCHBLENDE

Dr. Balley Exhibits Its Uses and a Dye Derived from it-His Health Injured by His Experiments.

The second of th

Dr. Balley said that his experiments had made him quite nervous, and he gave visible signs of being unstrum. Alarm was expressed less his continuation of his investigation might being on serious investigation might being on serious of those present to try to evolve some thing for proventing this nervoussess if they used thorad-X in their practice.

they used horses X. in their practices.

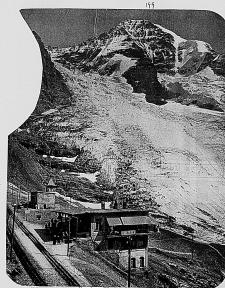
CHICAGO, P. S., S.-Dr. P. H. III. Simple and of Haltenman Mellott Gallen brief and the Benefit of Haltenman Mellott Gallen brief and the Haltenman Mellott Gallen brief and



A Station in the Heart of the







Statismatt Eiger Glacier



the Grindewald Valley from 7828 Eigerwand Station. Yungkau A



000bservation Platform at the Eigerwand Station.

NEW YORK, THURSDAY, MARCH 4, 1997 THE ROOSEVELT ADMINISTRATION

But of what nature is the Batavi Ichor that races through the veins of this extraordinary man? Out of what appealry and what environment t near and remote time came the dower of creatures that has made him the chief personage of our day, stridin over and dominating our whole stee of public action, vital, dynamic, head strong, self-confident, goaded by cease less impulse and sustained by unfail ing courage, the nightmare of th transgressor, with primal virtues that, proclaimed with ample iteration, evoluthe huzzas of the multitude, and wirl human faults, unsuccessfully dissembled, that make his judicious well wishers group? Genealogy would be stumped by the futile question. The history of Holland and the New Nothorlands would be ransacked in vote Fortunately, nobody cares, for no possible Roosevelt ancester could have made anything like the stir to the world that he has made, and none could have been half so interesting. Me is deeply interesting just now, a he is resumed back into the body of citizenship, since in the office he has so long held we shall not look upor his like again. The Rossevelt Presidency has been so continuous and to sistent in its demands upon our time and our thoughts, our admiration and our apprehension, that its ending in that instant of time at noon to-day finds the minds of men not a little bewildered, and unready, as yet, to harbor those appropriate emotions, whether of heartfelt thanksgiving or of almorre regret, that their respective opinions incline them to summon un Has THEODORE ROSSVELT in the

Presidency done more good than harm? Tite Times records its firm belief that he has done much more good than harm. The blunt, ungracious question is justified by the fact that doubting minds are pondering it, and will no cease to pender it until the pen of history shall record the judgment of an impartial and assenting world., It may be summed up in a sentence The good he has done will live long after him, the cvil will be soon cured Nations do not quickly backslide from, nor permanently lose, the benefits of moral awakening. As for the brulse and the hurts, they heal; as for the brawling demagogues and agitators who spring up in the wake of this great and successful popular leader, a sensible people will know what to de with them. The excesses and abuse of his Administration, his roughne in speech and act, his brusque smashing down of ancient and respectal motes and bounds, will serve rather as warnings than as precedents. His mer its, not his defects, will be exemplary.

"To have been the distinguishing merit of Mr. Roosevery's Administration, its most conspicuous achievement, that, seizing upon a propitious mo when scandalous exposures stirred the public resentment against corruption and chicano, he gave the American neonic a moral shaking up, and with boundless energy, unflagging zeal, and rivers of utterance raised and sweller the tide of their anger until, by pun ishment actually inflicted or through the deterrent fear of it, hosts of wrong Joers have been driven into honest ways, old abuses stamped out, and i sounder and fairer standard of co duct set up. There was need of a crusader. The insurance expeaures showed that conscience was asteep Trustees in control of hundreds of millions, given over to private greed, had fattened upon the funds in their keeping. Powerful " interests " were throttiling weaker competitors through fayors exterted from transportation companies in defiance of law and of fair dealing. At State Capitols and at the National Capitol great corporations "with privy paw" guided the pens that drafted statutes, as for a generation they have been accustomed to de with respect to tariff legislation, and prompted the enactment or the defeat of bills. Furtive meddling with legislatten is an assault upon the republican form of Government, A lawmaker who yields to corrupt enticement betrays his constituents, and the people no longer rule. Such things

indeed—that was earlier—but into a full realization of his power at a time when these evil practices—not new, they were invoterate and notorious had been brought afresh to the notice and the censure of the public. He made the meat of his opportunity,

have been, such things will be again-

Mr. Rooseveur came, not into power

In his first term, while he sat as a successor in the office left vacant by the death of McKinter, he incurred the wrath and aroused the fear of the men whose practices he denounced whose corrupt and comfortable plans he thwarted. In his second term he scared and angered them in a tenfold greater degree, and they had supported him with their votes and their money in the delusive hope that he would be quieter, not so fierce. It has been a rude awakening for them and for the country. Mr. ROOSEVELT is careles with his weapons, and the missiles h has sped somewhat at random in the general direction of rich malefactors have too often found lodgment in the besoms of the indigent rightcous, whose yells have swelled the anti-Roosevelt chorus, while their once still reddens the field.

But the result of the tumult and the carnage is that innumerable transgre ors have mended their ways, men inno cent of intended wrongdoing havlearned prudence, and, above all, the neonle have become watchful for their rights and their interest, and their servants in public office are more generally taking thought for the enforcement o the law. These benefits of the Roose velt rule are positive, substantial, and enduring. Great scandals have been exposed before, But the Cradt Manua ruption and the Star Route fraudi nspired the voice of no Rossevelt t trumpet them into the cars of the neople. The public conscience was not so alckened, and the resentment they provoked was but a passing spasm. Secret rehities, fitthy food, and poisoned drugs. Feat Office "graft," and the pillings of the public domain have been either abolished or very much lessened by the energy and the devotion to duly of Theodora Rodskysly. Let that stand to his credit.

There would be no offset, no debi count, if Mr. Roosevent had been like Lincoln a calm man, or like Wassingrow a man of sure judgment Unfortunately, his passionate temperaent has spurred him into excesses of violence and unreason that in their disestrous consequences have subtracted much from the sum total of the good he has wrought. Mr. ROOSEVELT cannot he charged with bringing on the panic of 1907. It had other sources. But we hink it can hardly be disputed that the pitch of excitement to which he had stirred the people and the passions with which he had inspired them intensified its immediate effects, and much prolonged the resulting industrial depres sion. Not alone the great and sometimes culpable interests, but all interests, all business, stood in fear of him and of the vengeful spirit he had roused. Business will revive but time must elange before the demagogues and the agitators in State Legislatures, mulous of his prodicious nonular success and thinking to climb to ambitiou seights by denouncing wealth and ray ing at the corporations, will be slienced and not out of the way of doing harm That legacy of evil is probably the would be leaved up. But the La Wollatter and the Jeff Davises will wear thementros out

Annum Jackson was as violent of temper, but, save in profaulty, he had no such vocabulary and power of utterance. So Mr. ROSSEVELT stands in unenviable isolation as the President who has been most abusive of his fellowcitizens. He has called men llars, many men even Committees of Congress; by has compiled lists of undestrable citizens: Le has denounced many male factors of great wealth with such wan of specification and discrimination that the people, hanging upon his flery words and watching the glare, but not always the direction of his eye, have come to believe that pretty much every body with a fortune in excess of the value of a decent form is a criminal. The population of New York City is, in many parts of the country, believed to consist of the predatory rich and the plundered poor. Wall Street is the vorite abode of Satan himself. Some of Mr. Roosevers's quarrels have been umiliating and disgusting. His temps and his vehemence made him forgetful of the dientry of his erest office. But for the exhibitating liveliness of the bout, men would have hung their heads in shome last Summer over the Ignoble spectacle of a President of the United States in shillalah-play with Bayan and Hacert.

No argument or extenuation can ever justify to upright minds two acts o President Roosevery, One is the wrest ing of Panama from the United States of Colombia. The other is the appea to Warriman for campaign money, fol lowed by the charge that Judge Pankur was mendacious when he asserted that the corporations had contributed to the Roosevelt fund in 1904. The officia telegram from Washington anxiously nguiring for news of the "uprising on the Isthmus" hours before the unrising occurred; the convenient presence o our war vessels; the prompt landing of troops, and the repeated orders to prevent the putting down of the revolt by Colombias isolaters tell the story of the birth of the Republic of Panana with all-sufficient distinctness. It is a statistation of the state of the

tinues up to this very hour to appeal to all Americans "in the name of the great fundamental truths of righteousness, which are alike dear to and necessary to each one of us."

That great talents should have be so often III omnloved is an occasion of serious repreach to Mr. ROSSEVELT. A man may be temperamentally fond o a fight, even of vulgar brawls, but most men have a sobering sense that th power and the responsibility of a high office involve the obligation of dignity Mr. Rocsevett was not schered, b was not repressed, he was turned loose. His immense egotism exulted in the possession of an office that brought him into the eye of millions, and he was annarently intoxicated with the sense of his power to speak and act. Do LYMAN ABBOTT, with full intent to be landatory, records this incident: President Rooseverr, sitting at his deals was reading to a few friends a forth coming message. At the close of a paragraph "of a distinctly ethical chaactor" he wheeled shout and said: "1 suppose my critics will call that preach ing, but I have got such a bully

pulpit!" Speaker Russ used to tell the story of Mr. Rooszygur's enthusiasm over h own personal discovery of the Ten Commandments. There is the parallelogram of forces. Primitive ethical cor cepts impinge upon a seething, un trained, undisciplined mind. The scene of action is the bully pulpit. The ro sultant is a deluge of utterance; in numerable protects of reform, crude and not thought out; a manle progres sive propensity to meddle with every human interest, from the regulation of corporations to the size of the family and butter-making; an overmastering desire to unlift eighty millions of nonnle by the hair; and a feroclous vitu peration of all who dissent from his plane criticise his methods or conose his purposes. No other President he ever spoken of his office as a bully pul wif or has used it as such to gratify an insatiable passion for preaching. The knowledge and the equipment of

the most cifted statesmen among all the great ones of history would have been overtaxed in attempting to do the things Mr. RODEFULLY essayed with full confidence and gayety of hear He had had absolutely no business of professional training. Ranching and public office have been his only voca tions. He was never in a position wher an error of judgment would have le sened his fortune or his income, ye lacking that stern disciplinary experi once, he rese to an office where he wa in measurable control of all the fort unes in the country, and he much abridged them, men say, the little with the great. The Constitution calls upo the President from time to time to give to the Congress information of the state of the Union. Nothing in the state of the Union, not the Trists, not the rallroads, not the malefactors, even so urgently demanded from the Exce utive sober consideration and enlightdution us the currency and the tariff. THEODORS ROSSIVELY its incapable of saying a word upon either subject that would in the slightest degree augment the common knowledge. The conomic side of his remarkable mind is rudimentary, and he knows it. The tariff is a bore, theories of taxation tedious, currency talk insufferable. So upon the subject of the tariff he has been content to put before Congress a mere paragraph or two which nobody remembers, or will ever have occasion to recall, and in respect to the currency he has wisely restricted bimself to recommendations from the report of the Secretary of the Treasury, who is supposed to have paid some attention to the matter. We find him recommending a progressive tax on incomes with bland irrelevancy to any actual or supposed need of revenue simply as a means of diminishing swellen fortunes. Last December, when the onthly Treasury deficit was running at a rate exceeding \$100,000,000 per year, he complacently reviewed the fiscal history of his seven years of Administration, and with evident pride pointed to a surplus for that period of receipts above expenditures

That, "respect for the constable's staff" which the historian FREEMAN regarded as the foundation stone of Angle-Saxon civilization and of civil order, is curiously deficient in the Roosevelt make-up. We have never heard that his youth was turbulent, but in his manhood and in the plenitude or his power he has often seemed to lack that understanding of law and of institutions and that respect for them that with most Americans, is ingrained. The Judiciary Committee of the Senate has just reported that he acted without warrant of authority in granting an invidual and verbal dispensation from the pensities of a criminal statute. He engerly adopted Judge Fannan's groesque device for fastening the Federal rasp upon every corporation, inter-State or within a State, under the Postronds clause. When labor appealed him for relief from the bothersome restraints of the injunction, he sent Mr GARPINLD with a bill ready drawn, to e laid before an amazed Senate, a bill that would have made ducks and drakes of equity jurisprudence. He entended with all his energy against a cesisting Senate to secure the passage of the Hopburn rate-fixing act in a form that would have called upon the Supreme Court to intervene for the assurance of Constitutional guarantees What she wanted was lawful in her do main, says Danze of Seminamis. The mind of President Rooseveur seems notimes to have been noncered with that idea. It is evident that he never

Auspected that the memorable Executive agreement with Santo Domingo was, in fact, a treaty demanding the assent of the Senate.

Mr. ROOSEVELT, as everybody knows, is a politician. "There goes the best politician in Washington," said Presient CLEVELAND once, as Civil Service issioner Roosevery was leaving the White House. But he is a politician in a larger sense, with breadth of view insight, and foresight. He has said himself that he studies attentively the currents of public opinion, of the people's thought and feeling, and spouses a reform only when it is already germinating in the minds of the massis, when they are ready for it, and ready to nectaim its champion. His off-hand espousal and later abandonment of the cause of the reformed spellers shows that he sometimes mis-

I took the speed and direction of popular currents. He was not the originator of the chief projects of betterment he so vehemently advocated. Action against the Northern Securities Company was suggested to him by an officer of a rival and alien ratiroad in terest. Mr. CARSATT put into his head the notion of a crusade against secret rebates, which was undertaken under the Eikins law, enacted without his ecial support. The Conservation Conference of Governors was first prosed to him by Mr. Rosent Unden-WOOD JOHNSON. It is a quality of great ness, however, to recognize the value of ideas from whatever source they ome, to develop them and make them available. For that Mr. Roosevery has a veritable genius, and his adaptations have borne fruits of immense popular cess. But who can imagine a me of the Roosevelt temperament and limitations bearing a useful part in the convention which framed the Constitu tion? It is well to take note of some of the things that lie beyond a popular President's sphere of interest and or pacity.

All Presidents are now and then mistaken in their judgment of men. Mr. ROOSEVELT probably not more often than those who have preceded him. Some of his chosen intimates have been more remarkable for their unquestioning loyalty and their instant acceptance of his plans than for their capacity to give wise advice about anything. It was a mistake for Mr. Roosever to decline, as he often did, to consult the opinions of those who differed with him. The critic of a nolicy may be the most valuable of all those who sit at the council table, since if his objections cannot be met, re-examination is plainly indicated. Mr. Roosevery's hosts of personal friends and his millions of admirers cling to him with unswerving devotion. When we find one of his culogists commending his "sobriety of judgment" we might, perhaps, better call it an unthinking devotion. The splender of his performance as an embattled warrior in the people's cause, driving before him the terrified legions of capital, has aroused country-wide dasm. In Texas, notably, they love him. Great numbers of his countrymen insist, and will continue to insist, that he is the greatest man of all time. Other great numbers feel that way about Mr. Baran. As an observed fact in political psychology agreemen upon the type is of more significance than the disagreement upon the indi-

The delight of Mr. Roosuvant's admirers in seeing capital pummeled was an emotion so immediate and keen that few of them took thought about the justice or the consequences of the proconding. The discovery that capital industries, commerce, business were, after all, a part of the vital organism came later. Then the enthusiasts learned that when the parts are bruised the whole must presently feel the hurt. It was that tardy discovery that ended the craze of Granger legislation. The American popple have again been instructed by the sobering experience o the past elxicen months, insomuch that toward the close of Mr. Roossymur's Administration enthusiasm has visibly ebbed. Deficits are a fee to the hur rahing habit, and the unemployed are little given to throwing up their hats.

Mr. ROOSEVELT'S comprehension of his duties has been marked by a strange and dangerous defect. He has count of the foundation principle of this Republic, that ours is a Government of limited and of divided nowers So he has been betrayed, upon the one hand, into encroncliment upon the sphere of other and independent departments of the Government and upon the other, into what seems to be consistent policy of controllection aiming at an undue and perilous aggrandizement of the strength of the Federal arm and a correlative denial of the rights of the States and an abridgment of their powers. His virtuni assertion of the right to use the men of the Secret Service to spy upon the behavior of Congressmen and Scnators-for that assumption inheres in his ill-considered statement that "the chief argument in favor of the provision (amending the Secret Service ap propriation) was that Congressmen did not wish themselves to be investigated by Secret Service men"-reveals an amazingly perverse notion of the relation of the Executive to the legislative department. For, of course, a Presi-dent disposed to resort to such methods would sometimes be able to terrorize opposition and make Congress bend to his will. His order for the demolition of the old Pennsylvania Station building in Washington Illustrates again his false conception of the Exec-

Government is to be disposed of by Congress, not by the President. Again, his slurs upon the judicinry, his outbreaks when the decisions of the courts obstructed his " policies," have exhibited the same characteristic failure to understand the principle of divided powers. A policy of centralization, if any President were permitted to persist in it, would lead inevitably toward a Dictatorship, Mr. ROSSEVELT has been thoughtlessly charged with dictatorial ambition. The charge is abourd as well as thoughtless. The Constitution, lightly as he has seemed to regard its inhibitions, has never been in danger from any act of THEODORD ROSSEVELT. There are two reasons why during these seven years of a turbulent and noisy Administration the country has been perfectly safe. The first is that, should our ir stitutions be visibly imperiled, we have remedies at hand, and we know how apply them. The second is, that Mr. ROOSEVELT'S Intentions have been good, sound, and wholesome. We believe that in all his policies he has sincerely sought to promote the public welfare. We give full faith and credit to that eloquent statement of his purposes to be found in his special message transmitting the report of the National Conservation Commission:

utive power. The property of the

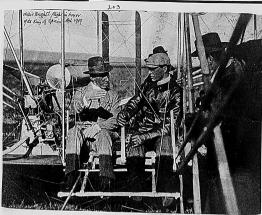
National Conservation Commission:
This Administration has neithern the property of the propert

meet are roally, from the public standpoint, undesfrable are permitted to become too large. Our sim is so far as possible to provide such conditions that there shall be equality of opportunity where there is equality of energy, fidelity, and intelligence; when there is a reasonable equality of opportunity the distribution for resurds will astrolution for resurds will astrolution for resurds.

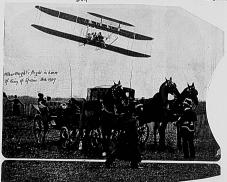
Now nobody can take exception to this, or to any part of it. That is what Mr. ROOSEVELT meant to do. has belabored where custom, tradition. and the Constitution limited him to recommendation. He has abused too many of his fellow citizens with senseless violence of speech. He has alarmed the country and shaken confidence by the roughness of his procodures. All that he has sought to accomplish might have been done and botter done, by a strict keeping to the paths of reason and of calmness. It is an inborn belligerence, a native joy of the fight, that has betrayed him and that constitutes the great blemish upon his career. Roused by oppositoo often lost sight of the initial and sound motive, so that he has sought to do anyway and at all costs things nstrably ill-advised. Yet in those fields of reform and betterment where he was peculiarly competent to recommend action and to lead the way he has spoken and acted with consummate wisdom. The moves he has made for the conservation of the National resources receive, and deserve, unqualified commendation. As a lover of nature he spoke eloquently of the necessity of conserving our forest domain. His vision of the wealth of our farms, our mines, and our watercourses has prompted him to make recommendations of profound wisdom for the preventing of improvident waste. A man speaks right on the things he knows, and these subjects Mr. Becarrers knows

It would have been a bleasing had equal knowledge guided him in other fields where his confident feet have ventured. We should have been sparred many alarma and much fujury had his temperament permitted him upon all subjects to spack with the temperamee and sagacity that have guided his tongue and pen in what he has had to say or write on the husbanding of rature's favor.

For his own reputation and for us, we must feel an infinite regret that he could not have cleared away our peccant humors by less drazite application, and that in his surgery of our deformities he was not more careful of the extent of the lacerations,



Wright Explaining the Working of His Aeroplane to King Alfonso.



Striking Picture of Wilbur Wright Flying at Pau.



TAFT AND ROOSEVELT IN FRONT OF WHITE HOUSE for 4949 Taken Just Before Leaving for the Capitol." (Plant. Capital 1970, by Harrit & Dirich.

#### 2-06 John Fritz Medal Presented to Charles T. Porter.

For the work in advancing the knowledge of stream of gluesting and for hippervenients in engine construction, Clarifier T. Portre, honorary member of the American Pritz Meshal by the committee representation to the found committee from warred the John from Committee from the Committee from the Landau Arthur and the Committee from the Committee for the found committee from the Committee for the Committee and by Denti W. F. M. Goos, University of Hilmotry, Charles and Committee for the Committee for the Houre, Charles and Politon for the Committee for the Houre, Charles and the Committee for England to House for the Committee for the Committee of the House of the Committee for the Committee of all the Committee for the Committee for the and transportation. Seemakhe make the Committee have been the noness of the Committee for the Committee of the Committee for the and transportation. Seemakhe make the Committee for the American Seemakhe and the Committee for the Committee for the American Seemakhe and the Committee for the Committee for the provident of the American Section of Medium Services and the Committee for the American Section of the American Section of Medium Section 1997. For his work in advancing the knowledge of steam or





CHARLES T. PORTER.

neers, and E. G. Splisbury, chairman of the Awarding Committee, presented the medal and its accompanying certificate. A number of congrutulatory letters and telegrams from John Fritz, the Iron & Steel Institute, Insti-tution of Mechanical Engineers of Great Britain and others were then read.

Professor Hutton indicated as the most important work of Mr. Porter the introduction of higher speeds with the solution of the problems involved, elevating the standard of mechanical construction and perfecting suitable condensors and governors. The address closed with a tribute to two of Mr. Porter's early associates, Prof. C. B. Richards and John F. Allen.

Mr. Hunt declared that from and steel engineering own a great deal to Mr. Porter. The remarkable develop-ment in the steel industry since the birth of the Bessemer processes was made possible practically by the applicaprocesses was made possible praceleally by the applica-tion of a more rapid power. Among the first to attach the rolling mill engine direct to its train of rolls were John and George Frltz, but the speed of the short strokes was limited. Mr. Porter was the first to give the rolling mill engineer a controllable, direct connected, economical bigh speed engine. Mr. Hunt contrasted two engines in the old Albany & Reasselner rolling mill plant in Troy. N. Y., in 1876. One set of rolls was driven by a walking



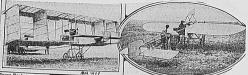
Bound not pressure signin, taken from the stemilised bound not pressure signin, taken from the stemilised record by Dester-Alba hida speed regimes. Mr. Sprange results the Preside Exposition in 1957 Mr. Sprange results the Preside Exposition in 1957 Mr. Sprange results that the stemilised of the speed ours exhibited, and drove observed side speed ours exhibited, and drove observed the 1880 Mr. Detrie Installation is find a proposed size for the Portal served Dislom strinks, New York, the first of an arrives of sprange and the string of the string of the 1957 string by a direct complex origins. The Portal relocation the credit for first comparison of the 1957 string to 1957 or 1957 string the 1957 string the 1957 string the 1957 the present production. the present possibilities.





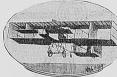


# all there were shown in Lordon in Med 1909 308



New Bleriot Monopla





Gastambide Monoplane Mc 1919

Delagrange Biplane







209

## EAST RIVER'S FOURTH SPAN

MANHATTAN BRIDGE BECOMES A REAL BRIDGE AT NOON.

Workmen Put Connecting Girders in Place and Then Drink "Pop" to Celebrate-Captains Blow Whistles at Sight of Flags - Engineers Pleased by Accurate Meeting.

Pleased by Accurate Meeting, [14] and [15] and [16] and [ hattan end, and four from the Brooklyn side. Three more pairs were out in place in somewhat more leisurely fashion, and

## SIGGEST BRIDGE IS OPENED

MANHATTAN SPAN TO BROOKLYN HAS COST \$14,000,000.

Jan 1 1910 Greatest Carrying Capacity in the World, Though the Part Over East River Itself Is Slightly Shorter than Two Other City Structures-Project Launched Ten Years Ago.

New York's newest and greatest bridge, the Manhattan, was opened formally this afternoon, and at five o'clock the ticket booths will be ready to collect the first wagon tells on the roadways.

Early in the administration of Mayor Van Wyck, who wa sthe first Mayor after the con-

Barly in the administration of Jayov Van Werk, has not she have been been considered by the Donor-tends of the Office of the Control of the C footwalk, flooring, laying of tracis and electrical equipment for car lines on the lower dack, and the electrical work needed for lighting the bridge, in 1900.



Sec Case " Qu 10 (Qoy perion of the realway, Manhattan bridge from the Brooklyn tower,



See Aux ap upon the cable under the tension of an adjustable brake. 1909



Li Que Ofth Pair of cables with suspenders in place.

# TARMAN'S OWN STORY

# OF HIS AEROPLANE FLIGHT

## lesult of Many Experiments, His Flight of Nearlya Milean Unparalleled Achievement,

CABLE dispatches to THE NEW YORK TIMES have already described in full the remarkable flight by which Mr. Henry Farman won a price of \$10,000, and incidentally an enviable fame. For the first time in the history of the world a man rose from the earth in a machine heavier than air, and after accomplishing a flight of 1,630 yards returned to his starttemphinaning affight of 1630 yards returned to his start, ling plant. He maintained an average height of admit stammy-five feet. His speed was thirty-from miles and hour. This unprecedented feat was accomplished with the shill, ease, and confidence of a scientist giving a

the still, can, and employees of a similar point, a barling demonstration our more in a circuit than the Powens inspects on more in a circuit than the Powens inspects of the state of the states over still threshy delives with enhance shall have been a state of the state of the state of the state over still threshy delives with enhance shall have formed and on positionate with position about horse formed state on the state of the s

#### By HENRY FARMAN.

N the day that I have wen the prize offered by MM. Deutsch and Arch-dracen to the first inventor to fly an inclosed circle of one kilometer in an aeroplane, I am glad to give to THE NEW YORK THES AN account of my New York Tixes an account of my preparation for this event and my senestions. I should state at once that I conceived the plan of building an aeroplane heavier than air a long time age. I even mentioned the matter to some of my friend, but they all declared that it would be an investigation of the plan of impossibility for any one to fix with any form or shape of heavier than air apparatus until some one should succeed in building a motor weighing not more

should succeed in building a motor weighing not more than two pounds for each unit of horse power.

This was seens time before M. Santor-Dumont proved to the whole world that flight on the heavier than air principle was possible. I saw M. Santor-Dumont when he first over 200 yards a talkagatelle in November, 1900. I then decided to take up the problem myself again. I foll confident that an aero-pooling myself again. I foll confident that an aeroproblem myself again. I foll confident that an aero-plane built on scientific lines and having a motor of not less than fifty heres power and weighing not more than 300 pounds would prove successful. I was also encouraged in my determination to build an neroplane by the achievements of M. Delagrange, who succeeded in covering a clear sixty yards without touching the ground. In the meantime I had con-sulted the Volsin Brothers and took part with them in some experiments with gliding planes at Paris-

These-experiments, I may say, were my that cesons in aviation. On the way back to Paris in the beases in covision. On the new Years in Fouris to the time I raws on contract to MML Vession to helded on the limit I raws on contract to MML Vession to helded on the limit I raws on the limit I raws on the limit I raws of the contract. On I should be also to fry all the limit I raws of the limit I raw working an interest in the limit I raws of the limit I raws of

I spent many days experimenting with it, but it you for many days experimenting with it, but it yould not fine in this from the ground. Then, on Tables I firm you did not experient to earn the result of the control o

Oct. 15, and made several sizor flethes of con. were lives, and four handed week each approximately, there are the control of the control o

On the first few attempts I was very successful, and the machine answered to the rudder remarkably well. I met with an accident however, later in the well. I met with an excless; however, jafer in the afternoon when making another trial which remules in the emaking of the motor and the projection. I had a new motor of the same make and power fittled, but at first it did not give attifaction, and I made very little progress. After this I spont severally drops working on the engine in the shed, improving drops working on the engine in the shed, improving the state of the state of the state of the shed project position. I would be supported to the state of bid, and further trials were fer to time being out of the question. of the question.

At this time I had the woodwork of the planer

povered over with canvas, which has been a great covered over with canvas, which has been a great improvement, and no doubt belped in no small meas-ure toward my success to-day. I also altered the shape of the machine, making the tallpiece much smaller than before and at the same time lighten. From this day until day before yesterday the weather From this day until day before yesterday the weather was freezing, but on Saturday last, despite the cold, I took the aeroplane out in the afterneon and made a flight of nearly two kilometers in a circle. This de-termined me to call out the commission of the Aero Club for this morning.

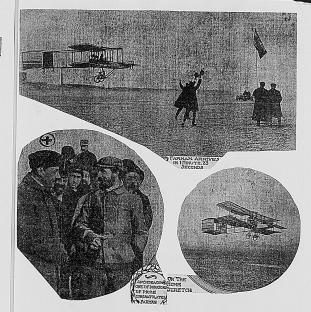
Club for this morning.

To-day I run in the filled early making my preparations, and when the commission deduced that they
prepared to early. The commission deduced that they
prepared to early. I must dentify that I fet is altitude
coxided, but at no time throughout the flight did I
fet servons in the loinal. I set the motor point, and
to serve the loinal. I set the motor point, and to
to let go, I soon felt the earth moving wavy from
mo. I regulated the elevaling plants, and rook higher
still. I had to use some exustion when creating the
still. I had to use some exustion when creating the
still. starting line, for a yard outside this would have meant another trial. Having got actify away from the starting point, I haved for the flagstaff on the other, machine was working beautifully, and I had absolute confidence in my success, indeed, at no time inrough out the flight did I lose course, for I had exist out determined to win the prize whatever might happen. My confidence in the acceptance was not misplaced. for on coming around the flagstaff, when half of the journey was accomplished, the machine was flying

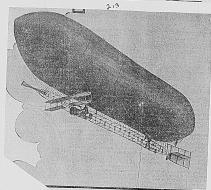
oster tann ever.

It was only a matter of a few seconds until I was up again in front of the starting line, which I had to cross again on the return. As I was approaching the end I felt greater confidence in myself than ever, and to show my triends that I was going to win I put up my hand and waved it to them.

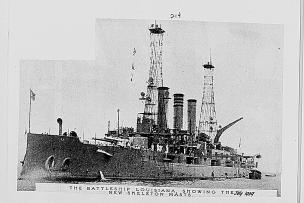
It was then that they gave a cheer, for the line was crossed, and I had won the much-coveted

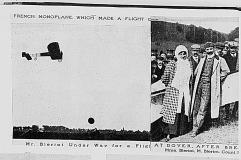


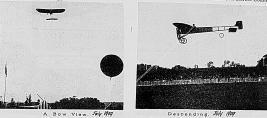


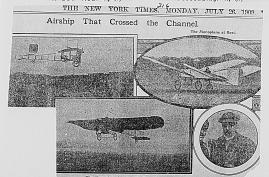


April 1909 'Dirgible No. z."-Signal Corps, U. S. A.

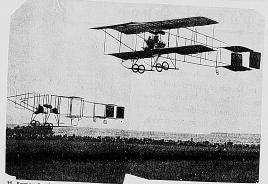






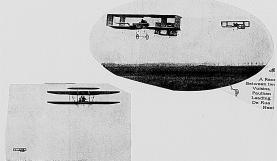


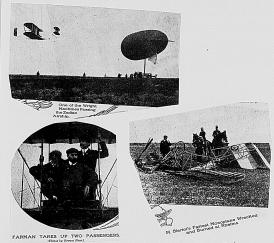
# RACES IN AEROPLANES NEAR RHEIMS, FRANCI

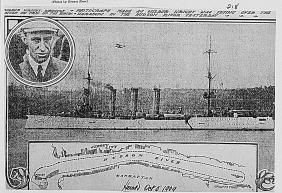


H. Somer (to the right) and Farman acing.

LISSANDIER LEADING.









## BEATS AIRSHIP SPEED RECORD

Delagrange Files 124 Miles at Rate of 49 Miles an Hour.

Obligancy Files. 128 Miles at Rales of
48 Millia an Hears.

"The Second of S

## LEON DELAGRANGE KILLED

FAMOUS FRENCH AVIATOR MET DEATH DURING FLIGHT.

Fell with Monoplane at Acrodromo at Bordeaux While Turning at High Speed Against Wind - His Notable Feats in Aviation-Had Broken Speed Records.

BORDHAUX, January 4.-Leon Delagrange, the famous French seronaut, was killed while making a flight here to-day He fell with his muchine from a height of about sixty-five feet, and was crushed under the weight of the wreckage.

He had been flying in a wind that was gusty, and which frequently blow at the rate of twenty miles an hour. In spite of this disadvantage he continued, and had circled the aerodrome three times when suddenly, as he was turning at high speed against the wind, the left wing of the monoplane broke and the other wing collapsed. The marking toppled over and plunged to the ground. Delagrange was caught under the weight of the motor, which crushed his skutt. Death was instantaneous.

The initial area.

Joseph Hongard Particle and the service of the very large and the service of the very large and the service of the very large and the period of the system of the very large and the period of th

making 3--18 mitte in 19 minutes and 19 minutes and 19 minutes and 19 minutes in 19 minutes and 19 minutes and

A real at times of over firty railes an inDelargance has childred great desired,
and at times add not desirate in take reave
and at times add not desirate in take reave
and at times add not desirate in take reave
and a plantered to a firty. The machine part
and plantered to a firty. The machine part
are considered in a fire of the Delargance part
are considered and better.
It was also at her day to Delargance
and the production of the real of the post
and the production of the product of the progreat when the manufacts was real to great and the
arms of the production of the proer, and in qualities was real to great a great when the manufacts are to the
production of the production of the proer, and in qualities was real to great a great from the
matter of the production of the proer, and in qualities was real to great a great from the
matter.

the crost. He presently shot of the posmodel, the product point of the posmodel, the position of the position of the pomodel, the position of the positi

FL ₹S

a in include said to her tent. a the h A tried of the tried of tr

## RUINOUS FLOODS IN FRANCE.

BUINDUS FLOODS IN FRANCE.

Parks thowny Damped-in-inductives
Also in Provinces and Germany.
PAUIL 28.0. The Unit to Mine. In
the Paull 28.0. The Unit to Mine. In
the United States of Children
to Mine States of Children
to Mine States of Children
to Mine States of Mine In
the Mine of All these arrosses main densthe waster of the Instances of the
Instances of the Instances
order of Mine Instances of the
Instances of the Instances
order of Mine Instances of the
Instances of Mine Instances
order of Mine Instances of the
Instances of Mine Instances
order of the Instances of Mine
Order of the Instances of Mine
Order of the Instances
order order order
order order order
order order
order order
order order
order order
order order
order order
order order
order order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order
order

Fontainableu and five persons were amound many injured.

There has been a decided change in the temperature and a heavy snow full fin the Champagne region, where the waters are still rising. Lyons and other cities on the Rhone and its tributaries suffered.

CQLOONE, Jan. 21—All the houses in the lower part of the city are imminated as a result of the ficels. A tup has been stationed at the Rhine Bridge to afford assistance to passing stamers. At Coblenz the ficel his reached such preportions that the people have been forced to use boats in order to get about the city.

see city.

SIGMARINGEN. Pressia, Jan. 22.—

SIGMARINGEN Castle, the original seat of the Hebenson Castle, the original seat of the Hebenson to M.J. Times - Jan- 22 1910

223

4 44. Times - Jen. 23 1910

## **FLOOD DANGERGROWS** IN FRENCH CITIES

Paris Subways Out of Business Cellars Are Inundated, Buildings Threatened, Seine Still Rising.

RAILWAY TRAFFIC CRIPPLED

Falling House Kills 12 in Belglum Streets Under Water in Many French Towns-\$400,000 for Relief.

Epochs Cable as THE NEW YORK THERE. PARIS. Jan. 23.—Second the like of which Paris has not known for thirty-eight years have occurred hero in the last twenty-four hours along the banks of the swellen Seine. The river at 2 o'clock this (Sunday) morning is still rising rapidly and the water is already more than ten feet above the normal level, but it is the picturesque charac-ter of the flood which impresses one most strongly.

The whole aspect of the river is changed. All the quays are completely submerged. Timber, wine casks, boxes, ure, and merchandles of variou nds are floating upon the turbulent current. All day swift police launche have been busy saving drifting objects of value, while crowds watched intently

of value, while crowds watched Intendy from the bridges and river parapets. The 1sie of Puteux, where is atta-tated the Island Club, much visited by Americans, has entirely disappeared, only the roof of the clushouse and the tops of the trees being visible. Some of the street have a Venicelike an-pearance The inhabitants, only silicative the control of the control of the control of the parameters. boats during the day circulated from door to door, or, at some points, from window to window

The flooding of portions of the unde The flooding of portions of the under-ground railway system threatens very groat damage, while from the prov-faces comes news of the loss of lives and of property worth many millions of france.

Landslide Buries Four Houses.

of frames.

Incidelle Burles Pour Houses.

Incidelle Burles Pour Houses.

Incidelle Burles Pour Houses.

Incidelle Burles Burles

Great Damage in Suburbs.

Great Downsel for a business.

Great Downsel for a properior from the properior from the

similarili to-tay.

TOURS, France Jan. 22—Heavy daing may have been cursed by the files of in the Lofter, and Inthra villays. Two before the common the common tenter of the comm CHARLEROL Belglins, Jun. 22—A large building in the course of construction and the value, the feuralations of which had been weakened by the rains, felt to-day, burying the workness in the rains.

224

SIXTEEN PAGES. HS. Times

## PARIS WATER SUPPLY MENACED BY FLOODS

One Main Bursts as River Continues to Rise Without Any Prospect of Cessation.

BRIDGES ARE IN DANGER

Many Houses Abandoned-Rallroads

and Electric Light Interrupted-Privation Among Homeless.

Symbol Chief Province Arming Processing Symbol Chief and Province Arming Symbol Chief and S ever known, continues to rise. Pears are already felt for some of the an-cient foundations

cient foundations.

The suburbs bordering the river be-tion Paris are largely under water, and tiere is distress and apprehension smong the inhabitants.

Jiere la distresse mei approhensien demog the holmbrians.

Many Hunciese and Rainest.

Many Hunciese and Rainest.

Many Hunciese and Rainest.

Anny Hunciese and Rainest.

Anny Hunciese and Rainest.

Anny Hunciese and Rainest.

In the work, seat of a million dissacer, the work, seat of the seatest and the seatest an

Soldiers Are Baking Bread.

patter summed of comments of courseless of the course of t

# PARIS FLOODS GROW:

5,000 ARE HOMELESS - Jan. 26/1

Water in Tunnel Bursts Through Street and Residents Flee

from Homes

FOOD IS BECOMING SCARCE Thousands Are Out of Employmen Through Closing of Factories Red Cross to Ald Sufferers.

PARIS, Jan. 23 .- At 2 o'clock this mor PARIG. Jan. 32—AL 2 o'clock this morning the unter which was ranking through board through the property of the party of th

At 330 this morning the flood from the Qual d'Orany Biation extended to the Rue du Bac, the Rue de Verneuil and the Rue do I Université.

It is estimated that the homeless in the outskirts of Paris number at least KOO.

Four soldiers have been drowned at Villenuve and three at Alfortville while engaged in rescue work.

engaged in rescou work.
PARIE, Jan. 2d-x-Premier Briand de-clared to-night that the attuation resulting from the floods is fast becoming desper-frence that the second second second second Works, after a tour of imprection, said that if the time escalinated nothing could prevent a deplorable disaster and the prevent a deplorable disaster and the interest of the second second second prevent a deplorable of the second prevent a deplorable of the pre-tain present to the to be adequate to the second sec

ont."

M. Lepine, Prefect of Police, is directing the saivage, which is being done by soldiers in auto boats at the risk of their lines.

effers in sack boats at the yeak of their lives.

All considers in their control of their All considers in their control of their All control of their control of their control the sold rein, which still continues, it causing intense suffering among those the bave been energied housings, with his bave been energied housings, with At midshight the water was less than 4 At midshight the water was less than 4 At midshight the water was less than 4 At midshight the water was less than 5 Two-side that his general is the affects of the second of

are closed any invesses.

The immessie bonded wurshouses at Barrow are hagelening to be invested by the sum of the barrow are hardward to be invested by the barrow and the barrow are hardward to be a barrow and the barrow are hardward to be considered. deep.
The Red Cross Society is organizing aid for the sufferers. Substriptions have been opened, and the theatres are arrange-

FRENCH CALAMITY

In attitude of the restriction of the control to the control to

one of the Handle for the benefits of the Section 18, 10 and 18, 1



BRIDGE, OF ARTS WHICH THE ENGINEERS MAY

BLOW UP

loverament, ininployed to-day,
at all ports and
wheat threlessly,
riand and the
inot left their
ra were unable
for help coming
Provinctal auinstructions to
without await
all Goverament,
of Cabbret were
tests for opping

beings, visible (2000) for the immediate possible production of the control of th

THE WEATHER.

Fair to-day and to-morrow; moder-ate west winds.

Fall Into Tunnels or Are Thrust

Up by Pressure of Flood

Beneath.

Houses Lest Removal of

Pressure Cause Collapse.

Deputies Carried from Chamber In

Boats-Many Thousands Homeless.

ONE CENT, in Greater New York, TWO CENTS.

ALLS 150 FEET. PARIS STREETS Is Wrecked, but He Is t Injured.

Jan. 27.—Hubert fratham, or, fell a distance of 120 CAVE AND BURST

TRAFFIC DUTY. lle Squeezed Between

In Brooklyn.

in Brooklyn.

In Brooklyn, in Comville of the Traffic at early last evening hesopio havrying out of the sopio havrying out of the 
1 at Atlantic and Flatin the Atlantic Avenue 
at last line Atlantic Avenue 
4c car going in the oppoto passing, and McCon1 between the two.

2 a wittlehman at the junchth court quickly and get 
the cart quickly and 
get 
the cart quickly and 
get 
the cart quickly and 
get 
the cart quickly and 
get 
the cart quickly and 
get 
the cart quickly and 
get 
the cart 
the car BUILDING WALLS CRUMBLE Caution Needed in Pumping Out SEINE IS STILL RISING

FOR GOVERNOR. Soldlers Ordered to Shoot Lootersive Secretary in Con-Enters the Field. Conn., Jan. 27 -The Hart

for the feetbary in Contine. An To-The State InAmerican Continues on the interest of the Continues of the Interest of the Continues on the Interest of the

ND BY HER BLOOD. tel Laurun addelning, which was purchased by the city in 2000 to be used as

i Sacrifice Leading to a maximum of ari native to be used as maximum of ari native to a maximum of a maxi

- IES. FRIDAY, JANUARY 28, 1910. \* GED BY THE FLOOD.



Communication of the communica Resume His Univer Harvard's Boy Scientii

Engine on a Long Freight Train **EOUR KILLED IN A WRECK.** 

FEAR IS FELT F 

BOYCH KITTER V BIG COBBY

BOYCH KITTER V BIG

n the y did y mn ho rk. It ducing v York, through slature, exten their heartfe

ish for the in ne Providenc FOR FI French tr s with suf adding to lef fund her-

ad comment ricans, on the

e forwarde to his previouslife Kieli nclosed \$10 a hope that has arrange l house and to rebui may be ref collection ct has been he suburbs aprived of vening with The work has alread ight until the River

thtly lowe in some of ring the for ringly anno-te river up ewalk at t in and the ed that the

o ita crest i

## THE WEATHER.

v or rain to-day; cloudy Sun-day; high northerly winds.

In Greater New York, | Elsewhere,

## FLOOD CHECKED: PARIS DESOLATE

and Soldiers Bear Dving from Threatened Hospitals.

AMERICANS ARE ALL SAFE

ernment Accepts Ald Offered by Our Ambassador, and Red Gross at Washington Issues an Appeal.

Special Cable to THE NEW YORK THEEL PARIS, Saturday, Jan. 29.—The floods in Paris were well above the highest previous record for high water on the previous record for high water on the Selne when early this morning it was officially announced that the river was at last stationary. At noon yesterday, when the water was still rising at the rate of an inch and a quarter an hour, and the rain failure beauty. Take of an inch and a quarter an hour, and the rain failing heavily, the gauge at the Pont Royal showed 30 feet 8 inches. The Figure has discovered the high water record for the Seine in July, 1035, hitherto unknown. The water at the Pont Royal then shoot at 9 meters \$2 centimeters, or about 30 feet 6 inches

Up to midnight the flood situation Up to midnight the flood situation appared to grow worse from hour to hour. Now, however, hope is entertained by those who are best informed. They declare that the waters have reached their final highest point. The weather has changed its mood half a decea times within forty-eight hours, was sain has been for child characters. yot rain has been its chief character-

After going to bed Thursday night omforted by the nipping breath of an rtune frost, the city awoke Priday to find the temperature again rison and the rain falling in a fine drizzle. The river was swellen more drizzle. The fiver was swollen more than ever. The flood was fast spread-ing on both banks of the Selne and bursting forth from the sawers was es-dangering masses of buildings in some of the busiest contres of the city. The of the businest control of the Cay, The rain poured down heavily in the after-noon and early evening. Then auddenly the clouds melted and the sky became

## HE NEW YORK TIMES, SATURDAY,

nerigitions have been opened in Belin for the fleed setfreers.

Fresident Stappashy are coming in
Greatest Stappashy are coming in
Greatest Stappash of the Chamber
Commerce in New York has been consulted in the committee will resent to
Commerce in New York has been set to be a reason as the commerce of the Chamber
Commerce in New York has been set to be a reason as the commerce of the Chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber
Commerce in New York has been set to be a reason as the commerce of the chamber of the chambe configures have been seemed in Dete but on the project of Chicago to add the programming of the Chicago to the project of the Chicago to the

RED CROSS ISSUES APPEAL BACON HOST IN FLOOD.

seador Entertained Quests in Calls for American Contributions to

PARIS DESOLATE

PARIS DESOLATE

PARIS DESOLATE

Brit Junior Later House, some Colors of the South Colors o

OPERA FLOOD BENEFITS,
soons of all respectation with the state of the

posed only among a community signature of the control of the contr

# Spirits of the People of Paris Rise as the River Performance at Opera and Soirees Are Held

Government Taking Measures! to Cleanse and Disinfect Flooded Houses

THEATRES ARRANGING AID FOR SUFFERERS

Sidewalk Tumbles Into the Subway and Railway Accident Occurs at Savigny-Sur-Orge.

MONEY POURING INTO CITY

Standard Oil Cables \$20,000, Speyer & Co. \$10,000 and Mr. Frank J. Gould \$5,000.

[SPECIAL DESPATCH TO THE HERALD VIA CO No. 40 AVENUE DE L'OPERA,

The Seine to-night has fallen almost a metre. The water is rapidly drawing back from the inundated streets and squares. The river is still twenty feet above its normal level, however, so that

The Res Royale dam was form open line Dutch honeswires cleaning their resistential, sind the street floor of the detail decided. In the street floor of the street floor is no busiest thereogethere, is at last opened unjoined but one which, it is traffic. So also is the Run Sind, fourte, without the work a good deal Ronors, and many other streets, relieving the best few week a good deal of the resistance of the street o



species. This rever is min revesty test

for the control of the co

Deficiently dans, in great form's seath in the great form's present posteron present. The measures are being subjective present present in Many houses have been for greated in Many houses have been formed by with from the cellular value of the first present pres



## American Ambassador

Mr. Robert Bacon Will Transmit \$200,000 to ti Cables \$2,000, While the Fund of the Courr

to tradic. So she is the Run state. Generally controlled to the Court Remote and may not be relevant to the court of the Court Remote and may not be remote and the court of the Court Remote and th

------

Efforts of Authorities Concentrated on Restoration of the Crippled Publie Services, and Cleansing and Disinfecting City-Pillagers Shot or Hanged to Lampposts.

PARIS, January 31,-From midnight until soon to-day the subsidence of the River Seine averaged only about a third of an inch an hour. The weather, however, con-tinued favorable, with a rising barometer. The temperature was slightly lower. The recession of the waters in some of the streets was noticeable during the forencon. The total fall of the river up to noon was two feet. It is predicted that there will be a further fall of sixteen inches in the Seine by noon to-morrow. The Marne has dropped three feet from its crest at Chaliert, and the Seine has receded equally at Montereau. The Youne remains stationary

Montreas. The Yonne remnise stationary clearly. The Flavor Department estimates that it will be two weeks before the Select Parallel to a control state. The situation at critical points was another than the selection of the sel side the civ until normal conditions are restored to prevent pillaging.

PILLAGERS SHOT: HANGED TO LAMP POSTS Final depth short; HANGE TO LANY "NORSE. Exciting rowboat chases after criminals on the deathfurs of the city tosk place hast night. In several instances the "apaches" were fired upon by their pursuers, and three were shot dend. Two others were hanged from lamp poets as examples of the fate in store for those detected in acts of pillage and tylleges.

in the chardner. Yesterday the image of an Operation of the Control of the Contro

STMPATHY AND AID.

Messages of sympathy and finestels contributions from abroad are still pouring.

in. Among the numerous sams cabbed intest from the United States were \$25,000
from the Standard Oil Company, \$15,000
from the Standard Oil Company, \$15,000
from Spayer & Co., and \$5,000 from Frank

| Contil

rom Speyer & Co., and \$3,000 from Frank.
Goald.
The GH Bins to-day proposes that the
numbelphility have a medal to be called
he "Medal of Paris" struck for bestowni
pha flood heroes. The women of the
reach mobility are playing an important
eart in the work of relief.

n in work of relief.

COLLINONS BUE TO PLOOD.

IONY-Sun-Orone, France, January 31

collisions due to the demoralization

ralirond trains service occurred her

Twenty-seven persons were injuree.

SEINE FALLING RAPIDLY.

## PARIS WILL SOON RECOVER.

W. K. Vanderbilt, Jr., Says City Will Be Herself Again in Fortnight. W. R. Vanderslitt, Jr., Says (19) Will be Hernel Again in Fertiliph. The Bernel State of the Hernel Again in Fertiliph. The Hernel State of the Hernel Again in Fertiliph. The Hernel Again is a set of the Hernel Again in He

ENGINEERS BLAMED FOR PARIS FLOODS

Masson Says Restoration Will Be Merely Stupendous Opportunity for Graft.

SPRING STYLES DELAYED

Fallure of Electric Lights Sets Bac Work of Famous Dressmakers-City Resuming Its Gayety.

Special Cable to THE NEW YORK TIMES. PARIS, Fob. 5.-The onslaught of reproof and repreach to which the engi-neering profession is now subjected in neering profession is now subjected in France on the theory that its members are responsible for the invasion of Paris by the fieeds is bitter in the extreme. Frédéric Masson of the French Acad-emy saks who are more nefarious, the Parliamentarians or the engineers, and substantially declares that the latter

To anys that the presumptuous and arrogant confidence of the engineers in their dry formulae provents them from seeing plain facts, of which the veriest ignoranus would take cognizance, such for instance, as that the windows which for Instance, as that the windows which open on the river only a fow feet above its ordinary level all along the subway that sideris its left bank invito disaster. He predicts that once the city is dried and scoured out the engineers will elected out plans for its restoration, the other feature of which will be that they will merely afford another stupenduous apportunity for political jobbers and corrupt continuous to make colonial control of the colonial co

The state of the speak-state of the state of the speak-state of the state of the st Charles Bos asserts point blank tha

More Disastress Than SiegeI find that ny estimate that the mation of the property of the control of the contion is at least equal to that inflicted in a side of the conmonthment by the opinions of other overliers, an indepting of whom even dethan this, work harm has born does not continue to the control of the control of the contrained for the control of the conlarge degree disorganized for almost a fortifielt. In many deportment of preparable, as well as others which it irreparable, as well as others when the course. More Disastrous Than Siege,

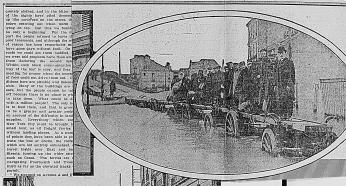
come.

For one thing, the Spring fashions will be considerably later than usual—that is to say, their full bloom will be retarded in all the high-class dressciscreted in all the high-claim dress making establishment in Paris, which, under sormal conditions, are lighted by under sormal conditions, are lighted by world-cinous sidellers cannot be will done without it. These places were suddenly described of every life of establishment of the place with oil lamps and condition in the suddenly described by the suddenly described with oil lamps and condition to the place of the "hotographers who make much money very year by producing early pictures f the most stunning creations of the camatreas's art are wringing their ands in despair. However, it is the mult shopkeepers of the flooded secsmall shopkeepers of the flooded sec-tions of the city who will probably suf-fer relatively the grantest losses of all. Then there were whole trades which were indirectly stopped by the flood. Sale of Confetti Barred.

The approaching marid gras festival analy, affords temporary opportunities for moneymaking to thousands in it the tride districts of Paris. They ad elected their carnival queens just efore the Sefino overleaped its banks, masual efforts were to be put forth a very to what he was to was the same to the sefino overleaped.

THE RISING OF THE FLOOD NEW YORK







A Scene in Javel, a Suburb of Paris

## Paris and Its Spirit.

really been lest. The little city which the Paristi called Lutetla, even after it had been conquered by the Rompas, never lest its individuality. The little island, now called the He de In Cite. T HE photographs printed on this and the two succeeding pages show the great floods of Paris and its environs at their greatest height. These pictures tell vividly the story of what the French capital has lately passed through. pictures reviews the flood generally, and in particular describes those country which received the heaviest visitations from the deluge of

N the midst of the terrible calamit

PHOTOS COURTESY LE MATE



Lutetla grow to be quite a flourishin Lutetia grow to be quite a flourianing little place, famed for its beneficial wa-ters, for the Romans, who were con-noisseurs in the matter, considered it and ideal watering place. After some centuries the Barbarians wanted to conquer the city, and as their forces were great, the destruction of Paris Note that the recent overflowing of the seemed imminent. But then St. Geno-seemed imminent. But then St. Geno-leve came to the rescue and the Bar-hings to be thankful for. The barians were turned away. And so

managed to keep its Gallie spirit, and all efforts to quell it were of no avail

NEW YORK HERALD, MONDAY, MARCH 7, 1910.

# RIOTS IN GERMANY \* AIRSHIP

# Maxim Aeroplane Is England's Hope 234



AND HIS NEW

Sir Hiram Feels Certain That His New Biplane, Which Boasts Many Novel Features, Is Real, Practical Solution of Problem of Human Flight-Machine Is Now Ready for Experiments and British Expect Its Complete Success.

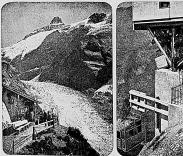
The production is the season of the first of the season of

be to the Health | Will appreciate from these figures how greater than in any other system so far Health Director, No. 130 First Strater, Loxbook Sensary, | 100 First Strater, | 100 First Strat

The New York Times. 

THE NEW AERIAL RAILWAY UP THE

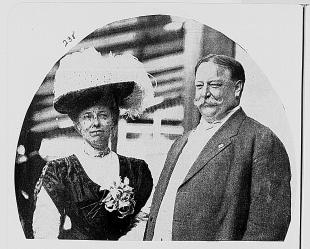






Sunday, March 6, 1910. WETTERHORN, IN SWITZERLAND

Two Cars on Their Way-One Rises the Other Descends.



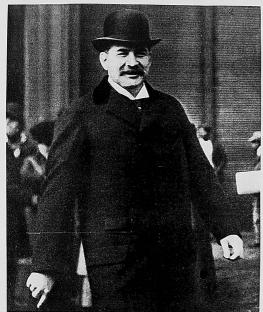


Sir Ernest Shackleton, the Explorer, Lady Shackleton and Her Sister, Who

## Photographs of President Caft o His Inauguration and During His Recent Visit in New York.



Leaving the New York Home of His Ny Times. Brother, Henry W. Taft. March 6 1910

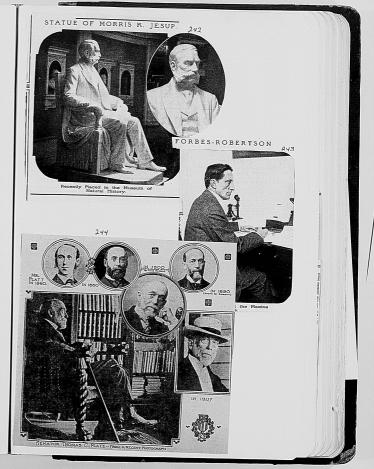


J. PIERPONT MORGAN. JR. ##Timet Mark 4:95

Taken a Few Days Ago on the Cocasion of the Departure of J. Pierpont Morgan for Europe.

On the Cocasion of the Departure of J. Pierpont Morgan for Europe.

On the Cocasion of the



FEBRUARY 16, 1910

### PURE POLONIUM FOUND BY MME. CURIE

It is a Possible New Element 400 Times More Active Than Radium.

MAY BE A NEW SUBSTANCE

Or an Old One Made Known for the First Time in Pure Form-Significance of the Discourse

Nows was received in this city yestenday from Berlin that Prof. Upmann of the Andersky of School thes should be successed to the success of Afron. Skidolowska Curin of the success of Afron. Skidolowska Curin of the School the School that h of a milligramme which Mme. Curis used having lost half in the 140 days red by her experiments. me. Curis discovered a more or less

#### WITH KAURI GUM DIGGERS

VARNISH SUPPLY FOR AMERICA FROM NEW ZEALAND.

How the "Fossickers" Collect the Fossil Resin, the Supply of Which Is Rapidly Dwindling-Much of It Is Buried Under Several Feet of

Earth-In the Ancient Maori Days.

The digging of knuri gum is one of the unique occupations of New Zenland. It is a dying industry, yet last year America

PIBRE TO SUCCEED OUM.

The detailed of hoor is not in the whole occupation of New Scales, it is a driven industry, yet least year American declarate to pay the shore of the Lotting trade. American marked it is their lock-declarate the pay the shore of the Lotting trade. American marked it is their lock-declarate the pay of the same of the shore of the story laws of the story pay the same of the story pay of the same of the story in the same of the hours of the same of the story in the same of the hours of the same of the story in the same of the same of the story in the same of the same of the story in the twin the carried should be same on the same of the story in the same of the same of the story in the same of the same of the story in the same of the same

rnment. They are asking what will become

when the many period degain that part of the course yet and the part of the course yet will be counted by the coun

The President and Trustees I hucrican Auscum of Sutural History request the honor of m. Boxolulov'p presence at the Commemoration of the Founding of the Museum in 1869 The Unceiling of the Statue of Morris Relchum Sesuf entledwading afternoon, the winth of Tetrawy at four velock The Commemoration and Presentation States in will be made by Joseph H. Choute one of the founders

247

The fixer of a cepty is requested 17th Heret and Central Back West . New York City

Trolley Equipment. ALL DEPENDS ON THE COST

Car Used Yesterday Seemed Satisfactory So Far as Its Mechanical Features Were Concerned.

The long-promised trolleyless atreet car which Thomas A. Didson declared five years ago would one day revolutionists and the control of the c

bere within aneny days, republish have Eccept for the undetermined selement, of east, the our second to leave fittle to be est. the our second to leave fittle to be selected to the control of the control of Transportation templeone families with selected to the control of the commont. and operations every in their commont. Italians Birret ferries to the size three fittless Birret ferries to the size three for copyens definite view. An Allense suggestive, bull modern, and our cases for fits storage hastery plant, our cases for fits storage hastery plant, our cases for fits storage hastery plant, our cases for fits storage hastery plant.

And the Domester Supplement was developed in the case they were given to under the grade and the case that the cas

NEW STORAGE CAR RUNS A FULL DAY

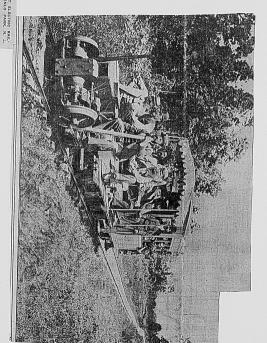
Edison Canned-Current Model Makes 66 Miles in Crowded

Streets Without a Hitch. NOW IN REGULAR SERVICE

Cost of Operation Estimated to be Less Than a Fifth of That of a Trolley Car.

Training car.

The new Edition strong hattery steed of the Twenty Conference of the Strong Conference of the Twenty Conference of the Strong Conference of the Twenty Conference of the Strong Confe



251

EDISON'S BATTERY READY.

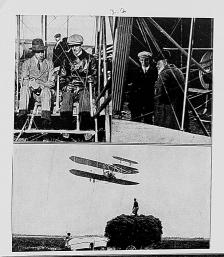
The Inventor Says He Will Try It at

Last on a Street Car.

Last on a Street Car.

WHEN GORANG, N. J., Jan. 10—
Thomas A. Edition sold it-only that he had everything residy for a test on a street everything residy for a test on a street care better, if he has a care of the control of the co

244





A NIGHT FLIGHT OF THE WRIGHT AEROPLANE Pills jatospanje sa male a gar ya. Spjender sh. jest lette M. (2001). FIGURI VI (116). WARDIT AGADUTANO.

Pills jatospanje sa male a gar ya. Spjender sh. jest lette M. (2001). Wijshi dovada kom a iljah. Rava sha ani dite mon lad fise. Me A. Davide Injune se a milisa jema de Tau Warst Warst, and a vanid carping intern om maspened jete nelse dane sempelet di medianchishi et seval at mich digita males. There have non-empeled i cartefulpor international de seval at mich de semantia de seval at mich de seval at mich

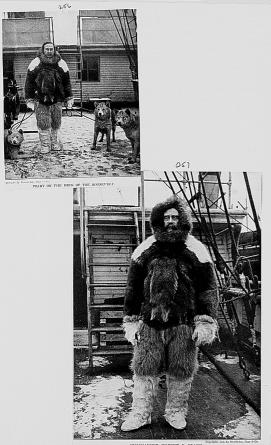


255





M. LOUIS BLERIOT THE PIEST ARRIAL NAVIGATOR TO CROSS THE ENGLISH CHANNEL IN AN AEROPLANE



COMMANDER ROBERT E. PEARY
WHO REPORTED ON SEPTEMBER 6TH, THAT HE REACHED THE NORTH FOLE
ON APRIL 6, 1909, AFTER TWENTY-THREE YEARS OF ARCTIC EXPLORATION



THE U. S. LINE-OF-BATTLE SHIP "DELAWARE," LAUNCHED IN 1880



THE PRESENT U. S. S. "DELAWARE" IN THE SAME DOCK, 1910

# CAMPING ALONG THE















Picture Section, Part 1

# The New York Times

Sunday, May 17, 1914

THE NATION'S HONORS FOR HER FIRST DEAD FROM MEXICO



PRESIDENT WILSON (X) DELIVERING THE FUNERAL ADDRESS AT THE BROOKLYN NAVY YARD OVER THE BODIES OF THE UNITED STATES SALIONS AND MARINES WHO WERE KILLED IN THE CAPTURE OF VERA GRUZ

The New York Times

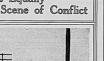
### SORROWING THRONG AT CITY



THE FUNERAL PROCESSION OF THOSE WHO WERE SLAIN IN MEXICO LEAV-ING CITY HALL THROUGH LINES OF SILENT, UNCOVERED MASSES OF CITIZENS, Inseet in Circle. Mayor Mitchell, Avenling the Procession on the State of the City Hall, Lieut, Kennel Bures the Wreath Civen by the City.

(Place (C) by Harmstein Liven Service and Place by Meein Levick.)

## Americans and Mexicans Equally Eager to Leave Scene of Conflict





DENSE CROWDS ON DROADWAY WHILE THE SEVENTEEN CAISSONS BEARING THE BODIES PROCEEDED FROM THE BATTERY, TO THE CITY H.ALL St. Pau's Chapel is Seen on the Right of the Picture (Photo by Broun Broad).





HATE THOMAS GUSING AND LUNTER, RETURNING PROM AN HUNT AT WHALE SOUND.





THE FUNERAL PROCESSION CROSSING MANHATTAN BRIDGE TO THE BROOKLYN NAVY YARD

(Photo (9) by American Press Ass'n.)

## PUBLICATION AND MICROFILM COPYING RESTRICTIONS

Reel duplication of the whole or of any part of this film is prohibited. In lieu of transcripts, however, enlarged photocopies of selected items contained on these reels may be made in order to facilitate research.

### A Note on the Sources The pages which have been filmed are the best copies available. Every technical

effort possible has been made to ensure legibility.

#### FINANCIAL CONTRIBUTORS

PRIVATE FOUNDATIONS
The Alfred P. Sloan Foundation
Charles Edison Fund
The Hyde and Watson Foundation
National Trust for the Humanities
Geraldine R. Dodge Foundation

Alabama Power Company

Anonymous

AT&T

PUBLIC FOUNDATIONS
National Science Foundation
National Endowment for the
Humanities
National Historical Publications and
Records Commission

#### PRIVATE CORPORATIONS AND INDIVIDUALS

Atlantic Electric Association of Edison Illuminating Companies Battelle Memorial Institute The Boston Edison Foundation Cabot Corporation Foundation, Inc. Carolina Power & Light Company Consolidated Edison Company of New York, Inc. Consumers Power Company Cooper Industries Corning Incorporated Duke Power Company Entergy Corporation (Middle South Electric System) Exxon Corporation Florida Power & Light Company General Electric Foundation Gould Inc. Foundation

**Gulf States Utilities Company** 

David and Nina Heitz

Hess Foundation, Inc.

Idaho Power Company

IMO Industries International Brotherhood of Electrical Workers Mr. and Mrs. Stanley H. Katz Matsushita Electric Industrial Co., Ltd. Midwest Resources, Inc. Minnesota Power New Jersey Bell New York State Electric & Gas Corporation North American Philips Corporation Philadelphia Electric Company Philips Lighting B.V. Public Service Electric and Gas Company RCA Corporation Robert Bosch GmbH Rochester Gas and Electric Corporation San Diego Gas and Electric Savannah Electric and Power Company Schering-Plough Foundation Texas Utilities Company Thomas & Betts Corporation Thomson Grand Public Transamerica Delaval Inc. Westinghouse Foundation

Wisconsin Public Service Corporation

#### BOARD OF SPONSORS

Rutgers, The State University of New Jersey Francis L. Lawrence

Joseph J. Seneca Richard F. Foley David M. Oshinsky

New Jersey Historical Commission Howard L. Green National Park Service John Maounis

Maryanne Gerbauckas Roger Durham George Tselos Smithsonian Institution

Bernard Finn Arthur P. Molella

#### EDITORIAL ADVISORY BOARD

James British, Georgia Institute of Technology
R. Frauk Calon, University of Southmunton
Louis Galanabea, Johns Hoykins University
Sussan Hookey, University of Alberta
Thomas Parks Hughes, University of Pennsylvania
Peter Rebinson, Oxford University
Peter Rebinson, Oxford University
Phillp Sernaton, Georgia Institute of Technology/Hughey Museum and Library
Merritti Reo Smith, Massachusetti Institute of Technology
Merritti Reo Smith, Massachusetti Institute of Technology

#### THOMAS A. EDISON PAPERS

Robert A. Rosenberg Director and Editor

Thomas E. Jeffrey Associate Director and Coeditor

Paul B. Israel Managing Editor, Book Edition

Helen Endick Assistant Director for Administration

Associate Editors Theresa M. Collins Lisa Gitelman Keith A. Nier Assistant Editors Louis Carlat Aldo E. Salerno

Research Associates Gregory Jankunis Lorie Stock Secretary Grace Kurkowski

#### Student Assistants

Amy Cohen Bethany Jankunis Laura Konrad Vishal Nayak Jessica Rosenberg Stacey Saelg Wojtek Szymkowiak Matthew Wosniak

#### Thomas A. Edison Papers at Rutgers, The State University endorsed by National Historical Publications and Records Commission 18 June 1981

Copyright © 1999 by Rutgers, The State University

All rights reserved. No part of this publication including any portion of the guide and index or of the microfilm may be reproduced, stored in a retrieval system, or transmitted in any form by any means—graphic, electronic, mechanical, or chemical, including photocopying, recording or taping, or information storage and retrieval systems—without written permission of Rutgers, The State University, New Brunswick, New Jersey.

The original documents in this edition are from the archives at the Edison National Historic Site at West Orange, New Jersey.

ISBN 0-89093-703-6



#### A SELECTIVE MICROFILM EDITION

PART IV (1899–1910)

Thomas E. Jeffrey Lisa Gitelman Gregory Jankunis David W. Hutchings Leslie Fields Theresa M. Collins Gregory Field Aldo E. Salerno Karen A. Detig Lorie Stock

Editors

Robert Rosenberg Director and Editor

#### Sponsors

Rutgers, The State University Of New Jersey National Park Service, Edison National Historic Site New Jersey Historical Commission Smithsonian Institution

> University Publications of America Bethesda, MD 1999

> MICROCOPY RESOLUTION TEST CHART (ANSI and ISO TEST CHART No. 2)



III I.4 III I.6





Compilation  $\ensuremath{^{\circ}}$  1999 University Publications of America. All rights reserved.